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Fred A. Henny, D.D.S., Editor

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Prevention and treatment of general anesthesia emergencies in dental practice

■ *Harry M. Seldin, D.D.S., New York*

Emergencies occurring during the administration of general anesthesia in the dental office must be treated promptly and vigorously or serious consequences may result. Close observation of the patient is mandatory since the prevention of cardiovascular and respiratory emergencies is much easier than the cure. Attention should be given to the preparation of the patient with regard to an empty stomach and premedication. Precautionary measures should be taken with a patient who is receiving steroids. A rehearsed plan of action in case of emergency is necessary and emergency instruments and drugs must be readily available.

Emergencies which occur while the patient is under general anesthesia generally may be classified as those affecting the respiratory, cardiovascular, nervous and gastrointestinal systems. An emergency originating in one of these systems, if not corrected, may lead to complications in any of the other systems and like a vicious chain can lead to death. To prevent or treat an emergency, the dentist must first recognize that it exists. He also must know the factors that cause these complications; the aim should be to eliminate such factors.

■ *Respiratory Emergencies*

By far the most common emergencies occurring during general anesthesia are respiratory. If the airway is not free and patent, hypoxia and anoxia will result. Respiratory obstruction will diminish gaseous exchange from the alveoli to the exterior and vice versa, and will result in an inefficient transmission of gases from alveoli to tissue and from the blood stream to the alveoli. The respiratory emergencies are caused by: (1) mechanical obstruction, (2) physiologic obstruction, and (3) organic disorders.

Mechanical obstruction may be caused by an incorrect position of the patient in the dental chair. An improper head position allows the chin to rest on the patient's chest, thus obstructing the airway. The chin should always be elevated to assure

an open airway. Pressing the chin against the neck and chest during surgery on the mandible will force the base of the tongue and epiglottis against the posterior pharyngeal wall causing an obstruction of the airway and produce mechanical asphyxia.

Blood, mucus, a soggy wet sponge or a loose tooth, if allowed to pass into the pharynx and larynx can cause mechanical obstruction of the airway. A properly placed mouth pack will act as a partition between the oral cavity and the anesthetic airway and thus prevent any foreign body entering and obstructing the airway. When the mouth pack becomes soaked with blood and mucus, it should be replaced by a new one. Suction must always be available and must be used constantly to remove secretions, blood and debris.

When the nasal inhaler is placed too high on the upper lip and nose, the base of the inhaler can obstruct the nares and interfere with an open airway.

Physiological obstruction of the airway can be caused by laryngeal spasm and bronchial spasm. During the lighter planes of anesthesia with thiopental sodium, the laryngeal reflex is very active. Any stimulation of the larynx, therefore, can produce a spasm or involuntary closure of the vocal cords, closing off the ingress of air or oxygen into the lungs. According to Fink[1] the shutter closure of the glottis causes an incomplete obstruction of the airway resulting in a phonation or stridor. This stridor can occur during expiration or inspiration. The expiration stridor occurs as a result of stimulus during light anesthesia. This spasm can be stopped by removing the stimulating cause or by deepening the anesthesia. The administration of an additional 2 or 3 cc. of 2 per cent thiopental sodium will deepen the plane of anesthesia and stop the spasm. If these measures fail, the administration of 0.5 to 1 cc. of succinylcholine chloride[1] will produce sufficient relaxation of the cords to break the spasm. The inspiration stridor occurs during the deeper planes of anesthesia and can be stopped by forcing oxygen under pressure, thus lightening the plane of anesthesia. If this does not help, succinylcholine should be injected to relax and break the spasm.

Since laryngeal spasms usually are caused by irritations of the vocal cords or by painful stimuli during very light anesthesia, they can be prevented by a properly placed mouth pack that will keep the blood, mucus, or dental debris from the pharynx and by starting operative procedure lightly and slowly, thus conditioning the patient to painful stimuli in the light plane of anesthesia.

Bronchial spasm is characterized by an asthma-like wheezing respiration. Expirations are prolonged and incomplete, whereas inspiration is accomplished with relative ease. Acute bronchospasm may arise from stimulation while the patient is in the light plane of anesthesia. In such instances oxygen should be administered under pressure. If the oxygen does not correct the spasm, aminophylline, 7.5 grains, should be administered slowly, intravenously.

Organic disorders, such as nasal growths, septal spurs, stenosis of external nares, deviation of the septum, adenoids, retropharyngeal abscess, cellulitis of the floor of the mouth, and so on, are impedi-

ments to free respiration and can, by respiratory obstruction, be the cause of hypoxia during anesthesia.

■ *Administering an Anesthetic with Insufficient Oxygen*

Trying to force nitrous oxide to the resistant or over-stimulated patient will result in overdosage and hypoxia. The oxygen delivered to the patient during the excitement stage is inadequate to meet the increased demand for oxygen by the body. In addition, the increased output of carbon dioxide pumps the tissues dry of this respiratory stimulant. The suboxygenation together with the rapidly waning reserve of carbon dioxide necessary to stimulate the respiratory center will cause the patient to pass rapidly into a state of exhaustion and respiratory failure.[2]

No patient should be overdosed with any anesthetic and suboxygenation technics should be avoided. For most dental procedures the patient can be carried in the light plane of anesthesia. We prefer to carry the patient on as much oxygen in the anesthetic mixture as is compatible with adequate anesthesia and in accordance with the physical state of the patient. Instead of using suboxygenation procedures, we prefer to induce the anesthesia with an intravenous barbiturate until the patient is in the light plane and then carry him on 50-50 nitrous oxide-oxygen. For maintenance, intermittent small doses of barbiturate can be administered if and when necessary. With this method the dose of barbiturates is decreased, the patient can be carried in the light plane of anesthesia, the percentage of oxygen in the anesthetic is greatly increased, and adequate pulmonary ventilation is assured.

Inadequate pulmonary ventilation of the lungs may occur during deep thiopental sodium anesthesia. This agent is a respiratory depressant. The depression of respiration results in hypoxia and carbon dioxide retention which can produce respiratory and cardiovascular complications. Though the thiobarbiturates are excellent hypnotics, they are poor analgesic drugs. They should be employed primarily for induction of anesthesia and not as the sole anesthetic agent.

■ *Treatment of Respiratory Emergencies*

The anesthetist must be on the alert constantly for any change in respiration, pulse and color of the patient as well as other warning signs of impending danger. Should they occur, corrective measures must be instituted without delay. The anesthetic apparatus should be able to deliver positive pressure oxygen when needed, and suction powerful enough to aspirate blood, mucus or vomitus is imperative.

As soon as any change in respiration is noticed, the airway should be examined; the operator must be certain that it is patent. All possible obstructions must be eliminated and prompt inflation of the lungs with oxygen must be accomplished. This usually will restore normal breathing. To expand the lungs partially with oxygen may require the application of a face inhaler with the exhaling valve closed and sufficient pressure to force the oxygen into the lungs. In the event that the patient does not respond, the base of the tongue should be pulled forward and

an airway inserted which forces the tongue forward and opens the airway. Artificial respiration by positive ventilation with forced oxygen is then instituted by use of the face inhaler.

Gordon[3] and co-workers made a detailed comparative study of mouth-to-mouth breathing and manual artificial respiration and found that mouth-to-mouth resuscitation is much superior to manual artificial respiration. According to them, mouth-to-mouth breathing is the only technic which assures adequate ventilation.

In case of an emergency where an open airway cannot be established because of laryngeal obstruction, a modified 13 gauge needle may be inserted into the trachea through the cricothyroid membrane. The needle is inserted in the midline of the neck, just below the thyroid cartilage.[4] The oxygen tube is then attached to a special adapter hub of the needle and the obstruction is thus bypassed.

■ *Cardiovascular Emergencies*

According to Reid and co-workers,[5] cardiac arrest must be distinguished from myocardial failure. Cardiac arrest is a sudden and unexpected failure of the heart to maintain circulation, whereas the myocardial failure, due to anoxia, can only occur where there are previously existing lesions of the mycocardium or the patient has valvular disease. Myocardial failure is never sudden or unexpected if the patient is under observation. Reid and co-workers[5] postulate that there are two causes of cardiac arrest: "First ventricular fibrillation, a functional fragmentation in which there is an incoordinated rapid contraction of individual muscle fibers with the result that no blood moves out of the heart." Injection of epinephrine makes defibrillation easier. It can be caused and cured by electric current. The exact cause of ventricular fibrillation is not known. "The second cause of cardiac arrest is cardiac standstill, in which the heart sits motionless in the thorax in diastole, and no blood moves out of the heart." For the heart to go into standstill, it must first have pre-existing lesions in the ventricular specific tissue, from rheumatic fever, diphtheria, or other disease, and second, the remaining healthy fibers are depressed by drugs or anesthetic agents. If, added to this, there is vagal stimulation, the result can be cardiac standstill. A healthy normal heart cannot go into arrest by vagal stimulation. The carotid sinus syndrome can only occur where there are lesions in the ventricular specific tissue.

The ventricular specific tissue is not so dependent on oxygen. Once the heart is in standstill, the resulting anoxia is very harmful to the myocardium, causing myocardial failure. Small thrombi form in the small coronary vessels which block the circulation of the blood. The heart is not nearly as sensitive to hypoxia as is the brain.

According to Reid and others,[5] "Atropine will minimize or actually prevent the undesirable reactions potentially present in autonomic reflexes. Atropine is an excellent agent for minimizing the likelihood of ventricular fibrillation." The action of atropine given intramuscularly is at its maximum in 20 minutes and provides protection for about an hour.

Sympathetic and parasympathetic stimulation can cause cardiac arrest.

Harvey and Levine[6] claim that emotional trauma and fear of the surgery and anesthesia can produce sufficient epinephrine release to cause ventricular fibrillation and cardiac arrest. The reports of cardiac arrest during the induction of anesthesia seem to support this theory. Fear and apprehension should be controlled by a proper psychological approach and by premedication. It is advisable to postpone surgical procedures for a cardiac patient who is scheduled for surgery under general anesthesia but who is in a state of anxiety and apprehension. Atropine is indicated for these patients.

The treatment of cardiac standstill is to re-establish myocardial circulation by closed chest massage of the heart until the heart responds to stimulus of its own specific tissue. The stimulus provided by several sharp blows on the chest over the heart is a good emergency technic which may result in contraction of the heart muscle.

Ventricular fibrillation can be stopped by electrical induction shock. The mechanism of ventricular fibrillation is not clearly defined and understood. Atropine can greatly minimize and prevent ventricular fibrillation.

The prevention of cardiac arrest is much easier than the cure. If the causes of cardiac arrest are avoided or corrected promptly, should they occur, the treatment will not be necessary.

■ *Nervous System Emergencies*

When a patient remains in a stupor for a considerable time after nitrous oxide or intravenous anesthesia, the chances are that he has been in too deep an anesthesia and hypoxia has resulted. The usual signs of hypoxia are a cold, clammy sweat, pallor, irregularity in or cessation of respiration, twitching of the skeletal muscles, dilatation of the pupils, and a slow, feeble pulse. If these signs are not noted and corrected promptly, cerebral damage may result. Cerebral damage due to hypoxia can occur with any anesthetic agent when improperly administered. Slight cerebral damage may be reversible, whereas extensive brain damage will result in death or imbecility.

The alert anesthetist can detect the early signs of hypoxia and correct them promptly by increasing the oxygen content of the anesthetic and by making certain that the airway is patent. If the patient is under light anesthesia with ample oxygen and an open airway, cerebral damage cannot occur. It is a preventable phenomenon.

The patient should be maintained in the light plane of anesthesia, light enough so that awakening is rapid enough to permit the patient to walk out of the chair, assisted by a nurse, just a few minutes after surgery.

■ *Gastrointestinal Emergencies*

The most important gastrointestinal emergency is aspiration of the contents of the stomach which may cause mechanical obstruction of the airway and asphyxia. According to a report by Edwards and coworkers,[7] 18 per cent of deaths during anesthesia are due to regurgitation and aspiration of the stomach contents. During anesthesia, regurgitation may occur and the stomach contents can be forced through the esophagus into the pharynx. It can then flow into or be inhaled into the larynx and trachea. The tracheo-

bronchial obstruction can then cause death by hypoxia and asphyxia.

Such deaths are preventable. The ambulatory patient must be instructed regarding the taking of food prior to surgical procedures to be done under a general anesthetic. For the patient who is to have a morning anesthetic, instructions should be given not to eat after midnight, and only fruit juice, tea or coffee with sugar and toast before 7:00 A.M. for patients having an early afternoon appointment.

In emergency surgery, with patients who have eaten food one or two hours before the anesthetic is to be administered, the stomach can be emptied of its contents by mechanical stimulation of the epiglottis. If vomiting occurs while the patient is under the anesthetic, his head should be lowered to the side, all food cleaned out of the oral cavity, and fluids aspirated with a wide lumen suction tip. Oxygen should be administered to lighten the plane of anesthesia and restore the cough reflex. Rapid induction and smooth, light anesthetic maintenance will tend to minimize the incidence of nausea and vomiting.

■ *Other Factors*

Increased anesthetic risk may also exist in patients who are or have been under adrenocortical therapy, in the aged, in persons with cardiac difficulties and in pregnant patients.

PATIENTS UNDER ADRENOCORTICAL THERAPY—The stress of anesthesia and surgery causes the adrenal cortex to increase the production and release the corticoids. This release of corticoids is usually secondary to an increased output of ACTH by the pituitary body. The increased amount of corticoids helps to maintain the fluid and electrolyte balance and prevent shock.

When a patient states that he is or has been under adrenocortical therapy, precautionary measures should be taken before surgical procedures are undertaken or an anesthetic administered. When a person is under therapy, the steroids suppress the ACTH secretion by the pituitary gland which may produce atrophy of the adrenal glands. A patient who has been on steroid therapy within a year may still have adrenal insufficiency. If a general anesthetic is to be administered to a patient on chronic steroid therapy, the therapy should be maintained before and for several days postoperatively. A patient who has withdrawn from steroid therapy recently and does not resume the treatment may not be able to withstand the stress of anesthesia and surgery and acute adrenal insufficiency may be precipitated with resulting hypotension and vasomotor collapse.

THE AGED—Elderly people are prone to arteriosclerotic cardiovascular disease or coronary atherosclerosis. Patients with angina pectoris give a history of chest pain on exertion that radiates mainly to the left arm. The pain of angina pectoris is brought on by exercise or effort that increases the cardiac load and is relieved by rest. Any anesthetic that may decrease the oxygen saturation of the blood can produce cardiac complications. Excitement during induction must also be avoided in these patients. Elderly people and patients with severe hypertension should

have a cardiac evaluation prior to surgery and anesthesia. The problem is not so much the patient's age as the morbid changes taking place which are a result of cardiovascular, renal and pulmonary disease.

The choice of the anesthetic as well as the method of administration should be based on the principle of providing the utmost safety for the patient. The deeper planes of anesthesia produce depression of the myocardium and vasomotor center. The young and healthy patient usually can adjust to these changes in body physiology. The aged and debilitated patients, however, cannot adjust so readily. All predisposing factors such as hypoxia, hypercapnia, as well as fear and apprehension, should be avoided.

In the aged and in patients with known cardiac complications, 100 per cent oxygen should be administered for about two minutes prior to the induction of anesthesia. The oxygen replaces the nitrogen in the respiratory system and prevents hypoxia during induction. Four to 8 cc. of 2 per cent thiopental sodium or 1 per cent sodium methohexital usually will put these patients to sleep and they can be maintained on a mixture of 50-50 or 40-60 nitrous oxide-oxygen. The lighter the plane of anesthesia, the safer it is for the patient. The anesthetist should endeavor to keep the patient in as nearly a normal physiologic state as possible, taking into account the alterations produced by anesthetic drugs and surgery.

ANESTHESIA DURING PREGNANCY—Recent studies have demonstrated that maternal stress in pregnancy is of prime importance as a cause of congenital or developmental defects of the offspring.[8,9] In the pregnant woman, the duration, intensity and timing of the stress are the most important factors to consider. The first 12 weeks of pregnancy are the most crucial period for miscarriage; after this time the fetus is apparently more firmly attached to the uterus.

It is also felt that stresses brought about by hypoxia during the first trimester are responsible for a majority of congenital anomalies. Hypoxia, especially during anesthesia, is the prime danger to the fetus. The fetus in utero actually lives in an oxygen environment corresponding to that occurring at about 23,000 feet above sea level. This low oxygen tension is not sufficient to support adult life.

The fetus manages to survive and develop with this low oxygen pressure because there is a pronounced increase in fetal hemoglobin. The fetal hemoglobin also gives off oxygen more readily than does that of adults and there is increased bone marrow activity in the fetus.[10] Should this meager oxygen supply be depressed still further by prolonged hypoxia during anesthesia, irreversible damage may be caused to the child in utero. A short hypoxic episode during anesthesia which may have only a transitory effect on the mother may inflict irreversible injury to the cerebrum of the fetus.

Because of the hazards of stress-induced abortion in the predisposed individual or because of possible developmental defects in the embryo, only emergency treatment for the relief of pain or for acute infections should be done during the first trimester of pregnancy.[11] From the fourth to the seventh month is the safest time for dental treatment.

The administration of a general anesthetic to a normal pregnant patient often is necessary and is seldom contraindicated. When the anesthetic is administered carefully and the mother is adequately oxygenated throughout the anesthesia and cardiovascular stress is avoided, there is no special hazard to the mother or the fetus. In pregnant patients, especially during the first trimester, we usually begin the anesthesia with 100 per cent oxygen for about two minutes, the anesthesia is then induced with 2 per cent thiopental sodium or 1 per cent methohexital sodium and maintained on a 50-50 nitrous oxide-oxygen.

When the surgical procedure is completed, the patient is administered 100 per cent oxygen for about a minute to maintain the high oxygen level of the blood.

■ *Avoidance of Emergencies*

1. Any anesthetic agent may be death-dealing in the hands of the ignorant and the inexperienced. No one should administer a general anesthetic without supervision unless he has had adequate training in anesthesia. In order to treat and avoid emergencies, the dentist must be able to recognize the signs leading to an emergency. No one person should assume the dual role of anesthetist and surgeon except in rare emergencies.

2. Every dentist administering a general anesthetic should have a preconceived plan of action in case any emergency should occur.

3. An emergency tray, comprising all drugs and instruments to be used in emergencies, must be readily available.

4. Emergency drill should be practiced at regular intervals in order to have proficient teamwork.

5. Preanesthetic evaluation of the patient is imperative. An adequate history of the patient will provide the dentist with pertinent facts about the patient's ability to withstand the stress of a general anesthetic and surgical procedures. Any pre-existing medical diseases and present or past drug therapy taken by the patient should be noted. Through the information provided by the patient, the dentist will be able to evaluate the type of anesthetic to administer or the advisability of postponing the procedures until a consultation with the patient's physician can clarify the medical status.—57 *West Fifty-seventh Street.*

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Use of halothane for anesthesia in ambulatory patients

■ *Michael J. Smirne,* D.D.S., Norfolk, Va.*

Experience with the use of halothane in conjunction with nitrous oxide and oxygen for ambulatory patients is reported. Two methods were employed in the administration of halothane. Because, in the hands of a qualified anesthetist, it produces relaxation which is not harmful, it is considered to be superior for the ambulatory patient as well as for hospital operating room procedures.

In 1956 Raventós and Suckling synthesized many fluorinated hydrocarbons, one of which, halothane, was found to have potent anesthetic properties. Halothane is similar to other more familiar inhalation anesthetic agents used in oral surgery, such as ethyl chloride and trichloroethylene. It is a halogenated hydrocarbon, but differs from these in that it has three fluoride, one bromide and one chloride ions.[1]

Halothane is a clear, colorless liquid with a pleasant odor. It has a specific gravity of 1.86 at 20°C., a boiling point of 50.2°C., and is much heavier than air. Halothane decomposes slowly when exposed to light, forming volatile acids. Such decomposition can be prevented by storing it in amber-colored bottles. It is noninflammable, nonexplosive, and stable with soda lime.[1]

Raventós[2] carried out his pharmacological investigations with halothane on animals and found that full surgical anesthesia was achieved after using 2 per cent to 4 per cent concentration of halothane in air or oxygen for 2 to 3 minutes. Anesthesia was maintained with a concentration of 0.4 to 0.8 per cent in premedicated dogs and 1 per cent to 1.2 per cent in unpremedicated ones. On the basis of these facts, halothane would seem to have double the potency of chloroform and four times that of ether.

Many experimental trials with halothane were performed,[2] and it was noticed that salivation and mucous secretions were abolished and vomiting did not occur at any time. There were no apparent functional or histologic changes found in the liver or kidney in animals after prolonged anesthesia with halothane. After noticing these interesting properties, a series of trial cases was studied. The advantages of halothane were as follows:

1. Halothane is nonexplosive.
2. It is nonirritating to breathe.
3. It is compatible with soda lime.
4. The salivary and bronchial secretions are diminished.

5. The bleeding is diminished without extreme hypotension.

6. It can be used as a reversible hypotensive agent.

7. It allows respiration to be controlled readily.

8. The recovery is moderately rapid considering its potency.

9. The incidence of postoperative vomiting is low.

10. The incidence of postoperative hypotension and shock is low.

The disadvantages of halothane were as follows:

1. Halothane produces cardiovascular depression.

2. It produces respiratory depression, apnea in deeper planes.

3. It frequently causes cardiac arrhythmias.

4. It is incompatible with epinephrine and levarterenol (produces ventricular tachycardia and ventricular fibrillation).[2]

Another series of cases was reported by Hudon.[3] Halothane was used in many different types of anesthetic machines with various technics. A series of cases consisting of 1,112 surgical patients of all ages was studied. The studies showed that induction with halothane and nitrous oxide-oxygen should be slow and gradual, rather than rapid. In this manner, the concentration could be kept within 1.3 per cent with adequate pulmonary ventilation. When halothane was used in the trichloroethylene bottle of a McKesson machine, the control was gradually opened up to no. 4 for induction and was turned back to no. 2 or 3 for maintenance. Oxygen was consistently maintained at a level of between 20 and 30 per cent. There seemed to be no analgesic period. In the second stage there was no evidence of mental confusion, coughing, nausea, vomiting or salivary secretions. Surgical anesthesia resulted in four to five minutes. Intubation could be accomplished without producing coughing or bucking movements and usually without using a relaxant.

■ *Current Study*

The oral surgery department of Kings County Hospital conducted a study consisting of a series of more than 100 cases using halothane (Fluothane), nitrous oxide and oxygen on ambulatory patients. At present, a continuance of this study is anticipated.

■ *Method*

Two methods were used in this study. The first method was used on 80 children between the ages of 6 and 13. A McKesson machine with a trichloroethylene vaporizer attachment was used. During induction, the machine was set at 20 to 30 per cent oxygen and 70 to 80 per cent nitrous oxide. There was a flow of gas under pressure of 5 to 10 mm. of mercury. Because the procedures were short in duration, only clinical observations were made. The children received no premedication. They were seated, draped and placed in a semierect position. With the use of the trichloroethylene bottle on the McKesson machine for the halothane, the control was gradually opened up to no. 3 or 4 for induction and turned back to no. 1.5 to 3 for maintenance.

Since children have a high metabolic rate, a relatively small volume of blood

and an unstable nervous system, they have a narrower margin of safety under general anesthesia.[4] Hence, the percentages and flows had to be adjusted according to the patients' demands. This made it difficult to record the precise amount of any of the agents used. Nevertheless, the general results were considered satisfactory.

The second method was employed mostly on adults of all ages. A Heidbrink machine with a Fluotec machine added was used. In this series a 6 to 3 liters-flow-per-minute ratio of nitrous oxide-oxygen was used. The halothane was gradually increased from 0.5 to 3 per cent for induction and then dropped to 1 or 2 per cent for maintenance.

With both methods, when the surgical procedure was half finished, the nitrous oxide was shut off and the patient was maintained on halothane and oxygen. Approximately one minute before the surgical procedure was completed, the halothane was shut off and the patients were permitted to emerge from the anesthetic inhaling pure oxygen. In some instances, the full-face mask, with a pop-off valve, was used for induction, after which a nasal inhaler was used. In other instances, the nasal inhaler with a pop-off valve was used for induction and maintenance.

■ *Results*

When the first method was used, the surgical procedures lasted from four to six minutes. The radial pulse was taken on each child and remained steady in the majority of instances. The recovery time was much more rapid than with nitrous oxide, oxygen and trichloroethylene. A very small percentage of the children had nausea and vomiting. Clinically, it was estimated that in all instances the percentage of halothane used was between 1 and 3 per cent.

When the second method was used, the procedures lasted from 5 to 15 minutes. None of the patients was ever in the deep stages of anesthesia, but the depth was satisfactory to the surgeon. There was a general elevation of blood pressure during the first few minutes of surgery. It was believed that this elevation was due to the lightness of anesthesia or possibly to a certain amount of carbon dioxide retention. The recovery time was between 30 seconds and 90 seconds. In all instances in which this method was used, there were never any instances of severe drop in blood pressure or respiration.

The case summaries shown in the table were selected at random from many adult ambulatory patients having oral surgical procedures. Halothane, nitrous oxide and oxygen were used, employing a Heidbrink machine with the Fluotec machine added since the Fluotec apparatus is calibrated in percentages and is the safest apparatus to use with halothane at the present time. Atropine, 0.6 mg., was given subcutaneously to each patient 30 minutes before surgery. Blood pressure and pulse were taken every three minutes during the procedure.

■ *Discussion*

In comparing the halothane technic with that of nitrous oxide, oxygen and trichloroethylene technics, the following observations can be made:

1. The patient has a relatively

Table • Case summaries of adult ambulatory patients having oral surgical procedures under halothane, nitrous oxide and oxygen anesthesia

Case no.	Age	Sex	Pre-medication	Blood pressure	Pulse	Recovery time	Percentage halothane	Postoperative complications
1	38	M	0.6 mg. atropine	120/80 140/90 130/80	85 95 90	1½ min.	2.5 to 3	None
2	23	F	0.5 mg. atropine	160/90 170/110 140/90	120 130 90	1 min.	2 to 3	None
3	36	F	0.6 mg. atropine	120/80 110/75 140/85	90 90 95	½ min.	1 to 1.5	None
4	28	M	0.6 mg. atropine	140/90 150/90 130/90	88 120 110	1½ min.	0.5 to 2.5	None
5	34	M	0.6 mg. atropine	120/80 130/80 140/100	80 80 110	1 min.	1 to 2	None

quick and easy induction, and the recovery period is short.

2. The patient has good color, and breathing is automatic and spontaneous.

3. Mandibular relaxation is good.

4. The amount of bleeding is subnormal.

The anesthetist experienced in the use of this agent can almost control the patient from breath to breath and meet the needs of either the surgeon or the patient. Because of the potency of halothane, he can give high percentages of oxygen, if needed.

Halothane is a rapidly reversible anesthetic agent. When intubation is necessary in hospital operating room procedures, it must be done without hesitation, so that pharyngeal and laryngeal reflexes do not reappear while the intubation is being performed.

■ *Conclusion*

Halothane in the hands of a qualified anesthetist is a superior agent for the ambulatory patient. An apparatus calibrated in percentages is the best to use for this agent. The anesthetist must be fully aware of the potency of halothane, for, if it is not handled properly, it may produce severe hypotension and depression of respiration.

An aim in anesthesia is to produce relaxation which is not harmful to the patient. Halothane fulfills this aim not only for hospital operating room procedures, but also for the ambulatory patient.—*8243 Redwood Circle, Forest Park, Norfolk, Va.*

The opinions or assertions contained in this article are the private ones of the writer and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

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Role of the Veterans Administration dental service in detection and prevention of malignancies

■ *Dayton D. Krajicek,* D.D.S., Wadsworth, Kan., and Richard C. Porch,† D.D.S., Merriam, Kan.*

At the Veterans Administration Consolidated Center in Wadsworth, Kan., patients with lesions of the head, neck and oral cavity are referred to the head and neck conference. The conference is sponsored jointly by the dental, surgical, pathology and radiology services. The weekly seminars are directed by the senior resident in oral surgery. Early diagnosis of carcinoma has been achieved in 59 of 362 cases presented to date. Over-all patient care has been enhanced.

An important consideration in the field of oral health is the growing appreciation of the atrophic, hypertrophic, degenerative, inflammatory and neoplastic changes which occur in the tissues of the oral cavity. This growing appreciation stems from the well-established fact that the mouth is one of the most prevalent sites for cancer in the human body where early detection may lead to cure. Unquestionably then, the morbidity and mortality of this feared disease imposes the obligation of early diagnosis upon the dental profession, in common with the medical profession.

A conservative estimate indicates that at least 4 per cent of all cancer fatalities are the result of malignancies in and about the mouth.[1] Until medical science is successful in determining the mysteries pertaining to the etiology of these malignant conditions, man's best defense still lies in early discovery and proper treatment of the lesions. Despite understanding of better treatment methods by the medical and dental professions, and planned, continuing educational campaigns directed toward awakening public interest in measures of prevention, the number of malignant oral tumors each year shows no significant indications of decreasing.[2] Actually, there is an increase from year to year, which is particularly distressing since such malignancies involve a readily accessible region of the body.

Obviously, efforts must be redoubled to cope with the challenge imposed by neoplastic disease. The role of dentistry

as a preventive health service must be broadened in its scope if the thousands of potential cancer deaths are to be prevented during the next decade. It should be kept in mind that malignancies of the mouth and face are more amenable to early diagnosis and, therefore, effective treatment than those in any other part of the body.

As guardian of the oral cavity, the dentist has the opportunity of seeing neoplasia in and about the mouth long before ulcerations advance to the extent that the patient is aware of the seriousness of the lesion and brings it to the attention of the physician. The majority of the primary tumors involving the head, neck or oral regions fail to receive early treatment because of the following factors: ignorance on the part of the patient, absence of pain, and misunderstanding of the meaning of minor symptoms of the ulcer. Unfortunately these symptoms are not considered serious at the beginning.

The burden of responsibility lies heavily upon all members of the dental profession to: (1) become thoroughly familiar with the characteristic symptoms and appearance of cancerous lesions in their early stages; (2) recognize that oral carcinoma in the early and curable stage may be masked by inflammatory, degenerative or traumatic diseases commonly seen in everyday examinations of the mouth, and (3) see with the mind, not merely look with the eyes, while conducting oral examinations.

Every dental office and dental clinic should be a cancer detection station for malignancies of the head and neck. Since benign and malignant neoplasms of the mouth, face and neck are so easily accessible to both visualization and palpation, early diagnosis should become commonplace. Yet, it has been estimated that not more than 10 per cent of all lesions seen in one large hospital clinic were in the early stages.[3] When the care and treatment of the geriatric patient are considered in this context, the clinical implication of early detection of tumors of the oral cavity and associated structures takes on increased significance.

In the Veterans Administration it is now common practice for the dental staff to conduct the oral phase of the routine admission physical examination for each veteran entering the hospital or domiciliary. Should a lesion which exhibits suspected neoplastic changes be encountered in the course of this examination, the patient is normally referred to the tumor board through his physician for consultation as a prerequisite for biopsy and histopathologic examination.[4]

Unfortunately most tumor boards have an opportunity of seeing only those oral lesions which have progressed to the extent that a diagnosis can be made with a fair degree of accuracy by visualization and palpation alone. Also, the schedule of most tumor boards is such that the dentist may be reluctant to increase the patient load by including, for example, all the hyperkeratotic lesions involving the vermilion border of the lower lip which may be encountered during the weekly oral examinations. Yet, if only one of these lesions should be malignant and misdiagnosed, the cardinal rule of early diagnosis for more successful treatment would be violated. This could be at the expense of a human life.

At the VA Consolidated Center,

Wadsworth Division, Wadsworth, Kan., special attention is directed to lesions of the head, neck and oral cavity by referring patients with such lesions to the established head and neck conference. This conference is an outgrowth of the original oral lesion seminar established at this Center October 7, 1957. Membership was expanded to secure greater participation in the evaluation of all suspected benign and malignant lesions of the head, neck and oral cavity. Every appropriate patient must be scheduled for examination by this group conference as a prerequisite to the treatment phase.

The conference is jointly sponsored by the dental service, surgical service, pathology service and radiology service; however the direct responsibility for arranging and conducting the weekly meeting is charged to the dental service. All staff physicians and dentists are invited and encouraged to attend, especially if they have a patient to present. Attendance is mandatory for all dental residents and the rotating dental intern.

Originally the weekly meeting of the head and neck conference was held in the hospital dental clinic. With the interest shown by the entire professional staff steadily on the increase, it soon became evident that the dental clinic was no longer adequate as a meeting place. The addition of residents to the hospital staff made it impossible for each conferee to see and evaluate the lesion presented. Furthermore, the necessity for an adjoining room where the diagnosis and treatment of the lesion could be immediately discussed and planned, pointed up the need for scheduling the meeting in another part of the hospital.

This weekly seminar is currently held in the conference room, near the hospital dental clinic. An adjustable E.N.T chair has been made portable by the addition of four casters fastened to the base of the chair. The necessary E.N.T light stand has been altered to accommodate a Pelton adjustable dental light. This stand has also been equipped with casters similar to those for the chair. Thus, the advantages of an adjustable dental chair with adequate artificial illumination are still maintained.

■ *Direction of the Conference*

Directing the head and neck conference is the responsibility of the senior resident in oral surgery. Members of other hospital services are encouraged to present patients and submit consultations to the oral surgery service. Local and nearby medical and dental societies are also extended invitations to participate.

Many of the patients brought to the head and neck conference result from admission or annual oral examinations carried out at the domiciliary clinic. They are seen to determine the need for hospitalization or treatment on a domiciliary basis. The remainder of the patients presented are seen on routine oral examinations in the dental clinics, consultation from other hospital services or on a recall basis.

The patients' complete past medical and present case history is offered first. This consists of the physical examination pertinent to the immediate problem, plus laboratory data, roentgenograms, previous Kodachrome transparencies and histopathological slides. The physician or dentist presenting the case generally states

his provisional diagnosis and treatment plan.

The patient is then brought before the conferees. Adequate equipment is provided for each member to conduct a complete oral examination. The patient is excused and appropriate recommendations are made. A treatment plan is adopted based on the combined opinion of the members present. All data are recorded in the conference records as well as in the patient's hospital chart, which is returned to the ward physician. In this way, immediate attention is drawn to the patient's needs. Permanent records of the head and neck conference for each patient include roentgenograms, Kodachrome transparencies, study models, and histopathological slides. These are accurately maintained for comparison at recall visits and postoperative evaluations.

The staff oral surgeon directs the resident to present only those cases considered to be of major interest to the conference as time will not allow every patient with a minor lesion to be seen. This latter group is scheduled for recall by the dental service for observation, biopsy and perhaps possible presentation to the conference at a later date.

An average of five patients are evaluated weekly. Records indicate that the great majority of these patients receive some form of treatment as a result of these examinations.

■ *Results of the Conference*

As stated previously, the primary function of the head and neck conference is early diagnosis and treatment of malignancies of the head and neck. However, related oral surgery cases of interest to the combined staff are presented when time will permit.

There have been 362 cases presented to date. In 130 instances, the patient has been operated on either completely or partially by the oral surgery service and 53 by the hospital surgical service. There have been 116 biopsies and 30 lip shaves, resulting in proved early diagnosis of 20 instances of squamous cell carcinoma, 38 instances of basal cell carcinoma, and 1 mucoepidermoid carcinoma of the palate. Seven of these patients have been treated by radiation therapy, the rest by surgical intervention.

Cases involving facial fractures and the reconstruction of traumatic defects, assigned to the dental service, are often presented, the treatment plan discussed and evaluated by all members present.

Examples of other types of cases assigned to the oral surgery section include submaxillary salivary gland removal, mandibular bone graft, closure of oroantral fistulas, treatment of trigeminal neuralgia, treatment of mixed tumors of the minor salivary glands, and the construction of prostheses for surgical defects after tumor excision in conjunction with the prosthodontic section.

■ *Summary*

The function of the head and neck conference in a Veterans Administration Hospital has been described in regard to its organization and purpose. Some data have been presented to illustrate the value of such a conference in the program of a teaching hospital. Its value in the early diagnosis of malignant lesions and in providing a broader experience in an oral surgery residency has been stressed.

■ *Conclusions*

It is the feeling of the staff of this hospital that the head and neck conference is a valuable adjunct in the over-all teaching program. It increases the diagnostic acumen of the combined staff, thereby providing the best possible care to each individual patient. Unquestionably, interdepartmental relationships have been strengthened, the professional stature of the dental service has been increased, and the scope of dental treatment has been broadened.

We know that many cases of oral malignancies have received early diagnosis and treatment and over-all patient care has been enhanced at this institution as a result of the head and neck conference. It would seem that a conference of this type should play a major role in any hospital teaching program.

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■ Dental Roentgenography

X-radiation is a much talked about hazard with too little distinction made between a 1,000 roentgen local therapeutic dose, a 500 roentgen total-body lethal dose, a 0.1 roentgen localized diagnostic dose or the 0.001 milliroentgen (0.00001 roentgen) gonadal dose from a properly shielded diagnostic radiograph. The normal daily background radiation is large in comparison to the gonadal radiation for many properly taken diagnostic x-rays. Nevertheless, dental x-rays often repeated in children constitute a present area of concern, not so much from the standpoint of gonadal dosages but in view of the rather large total dosages that can accrue from a number of series of full-mouth radiograms. While cumulative small dosages apparently have less biological effect than single large doses of the same order of magnitude, the effect of 100 roentgens or more of x-radiation to the developing teeth and jaws is of current concern. At the same time, the advantages of careful dental radiography are considerable and should not be neglected. One cannot ask a pedodontist to exert every possible skill in treating a child's teeth without affording the dentist the opportunity to make whatever diagnostic x-rays necessary. Here is one area where technological advances in radiography have fallen well behind. Even with present techniques, it is possible to obtain adequate radiographs of the posterior teeth with a much lower total dosage of x-radiation. But the films, which have been speeded up by 100 per cent in the last three years, need to be ten times faster before repeated full-mouth x-rays cease to be a source of immediate concern.—*Stanley M. Garn, Growth and Development, The Nation's Children, 1960.*

Comparison of the cutting effect on bone of an ultrasonic cutting device and rotary burs

■ *Thomas A. McFall,* D.D.S., Washington, D. C.; George M. Yamane,† D.D.S., Seattle, and George W. Burnett,* D.D.S., Ph.D., Washington, D. C.*

Roentgenographic and histologic studies of the tibias of white rats which were cut with an ultrasonic scalpel and rotary burs with and without saline as a coolant, reveal that the most rapid healing takes place when the bur cooled with normal saline is used. However, bone cut with the ultrasonic device and a saline spray healed satisfactorily within the experimental period. It may be advantageous to use this device in bone surgery, therefore, provided that the heat that is generated is dissipated by saline spray.

The cutting of bone in surgery has been accomplished for many years by variations of the chisel, either as such or modified as rotary instruments using multiple cutting edges, each similar to or identical with that of a chisel. When used in bone surgery, rotary abrasive devices produce considerable heat and trauma, cut inefficiently, clog, and contaminate the region with abrasive particles which might interfere with healing. An ultrasonic instrument could be adapted for use in bone surgery if it cut more satisfactorily than previous methods and if the tissues healed normally.

When high frequency cutting instruments powered by variable frequency oscillators were developed for dental use, their effect on certain oral tissues, particularly dental pulps, was investigated[1-16] but the cutting efficiency and the biological effect of ultrasonic cutting devices on bone have not been thoroughly determined. When an ultrasonic device was used to cut the teeth of dogs, it caused no significant change in alveolar bone.[14] In another study[16] which determined the response of oral tissues to ultrasonic waves, more particularly the dental pulp, no changes were noted in alveolar bone. Since neither the usefulness of an ultrasonic cutting device in bone surgery nor its effect on bone has been adequately demonstrated, a comparative study was made of the healing of bone cut with an ultrasonic instrument and rotary burs.

■ *Experimental Procedures*

The tibias of adult white rats were used to determine the effect of various cutting technics on healing. For this study 40 adult animals, each weighing between 300 and 350 Gm., were divided into four equal groups according to the method

used to cut bone. The groups were as follows:

Group I: The tibias of this group of animals were cut with an ultrasonic scalpel, using sterile saline solution to flow over the tip and flood the region of operation.

Group II: The tibias of this group of animals were cut with an ultrasonic scalpel but with no fluid covering the tip or flooding the region of operation.

Group III: The tibias of this group of animals were cut with sterile no. 559 burs rotating at 4,000 rpm, with sterile saline solution flooding the region of operation.

Group IV: The tibias of this group of animals were cut with sterile no. 559 burs rotating at 4,000 rpm but with no fluid covering the bur or flooding the region of operation.

Each animal was anesthetized by intraperitoneal injection of pentobarbital (dose, 3.0 mg. per 100 Gm. of body weight). The tibias were then exposed by aseptic surgical procedures, care being taken not to tear or unduly traumatize the periosteum. An approximately 2 by 2 mm. section of bone was then removed either by ultrasonic scalpel or rotary bur. The ultrasonic surgical instrument used for cutting the tibias was a thin, sharp, scalpel-like blade (Fig. 1). The incision in muscle and fascia was then closed with no. 000 cotton sutures and the skin closed with no. 0 silk sutures. Lateral view roentgenograms were made at the end of the operation, at several postoperative intervals, and at the time of sacrificing the animals. During the entire postoperative period, all animals were carefully maintained on a normal laboratory chow diet, with vegetables twice weekly. Roentgenograms were made of the animals' legs on the forty-second postoperative day. The animals were then sacrificed and the bone and surrounding tissue of the field of operation were removed and fixed in Bouin's solution. The tissues were decalcified in Morse's solution, embedded in paraffin, sectioned, and stained with hematoxylin and eosin.

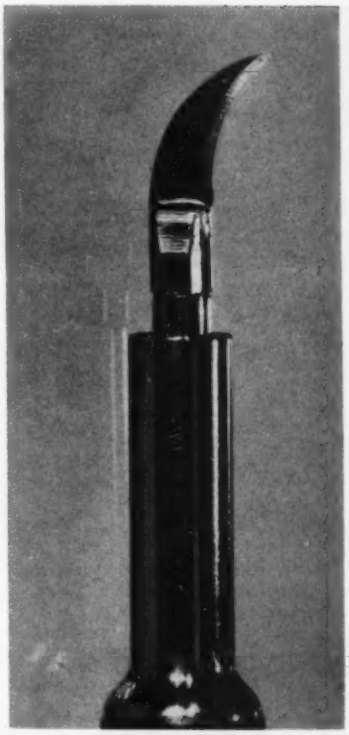

Fig. 1—Scalpel-like blade adapted to ultrasonic instrument for cutting bone

■ *Results*

Several types of ultrasonic surgical tips were tested and the best and most convenient was found to be a scalpel-like

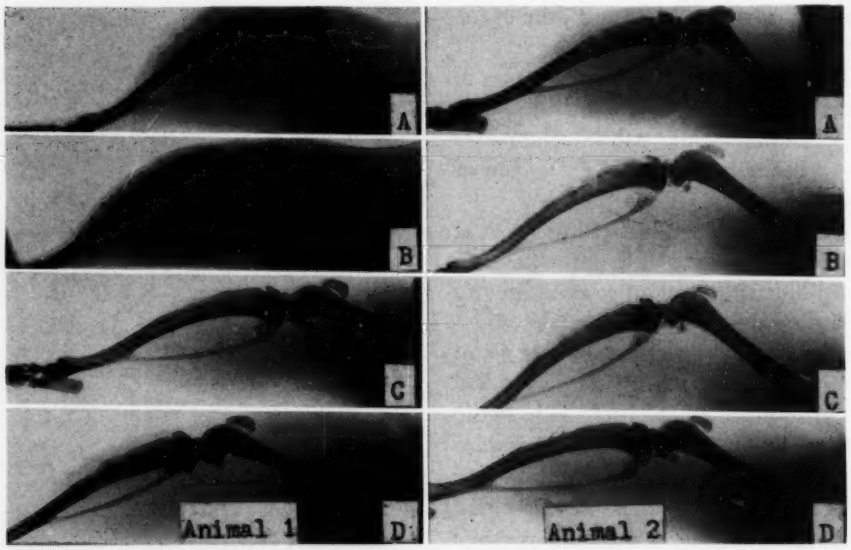

Fig. 2—Tibias of rats cut with ultrasonic scalpel with (Animal 1) and without (Animal 2) sterile normal saline solution bathing tip during cutting. With each animal, roentgenograms were taken immediately postoperatively (A) and at 18 (B), 36 (C), and 42 (D) days. Healing, as evidenced by relative degree of calcification, appears to have occurred more rapidly when sterile saline solution was used to cover cutting tip (Animal 1) than when tip was used dry (Animal II)

blade which cut the rat tibias with only light pressure (Fig. 1). The ease and facility with which the instrument could be used allowed for a more accurate and predictable pattern to be cut in bone than usually could be accomplished with rotary burs. Rotary burs were frequently difficult to control when cutting bone, resulting in inaccurate cuts and undue soft tissue damage. Furthermore, there was no clogging of the ultrasonic cutting tool, which happened frequently with rotary burs.

ROENTGENOGRAPHIC DATA—Comparisons were made by means of the roentgenograms of the relative rates of healing of bone cut with the ultrasonic instrument and rotary burs (Fig. 2, 3). The roentgenograms of the animals shown in Figures 2 and 3 are typical of those of the other animals in their respective groups. Based on these roentgenograms, which are in essence a measure of the degree of calcification, the tibias cut with the ultrasonic scalpel bathed in normal saline solution were essentially healed after 42 days (Animal 1, Fig. 2,A-2,D). When the tibias were cut with a dry ultrasonic scalpel, healing did not progress so rapidly or satisfactorily, for calcification was not completed in the cut area (Animal 2, Fig. 2,A-2,D). In the tibias cut with a rotary bur covered with normal saline solution, healing progressed rapidly and the callus was calcified by the end of 36 days. Although there was a slight depression in the cut area, the cortical plate was essen-

tially restored and little remained of the callus at the end of 36 days (Animal 3, Fig. 3,D). In the tibias cut with a dry rotary bur, healing and calcification progressed satisfactorily but not as rapidly as when sterile saline was used to bathe the bur during the surgical procedure (Animal 4, Fig. 3,A-3,D). In general, roentgenographic data indicate that the tibias cut with rotary burs bathed in sterile saline solution healed more rapidly than did the tibias cut with the ultrasonic scalpel with saline solution flooding the cutting tip (Group I animals). As seen in Figure 4,A, Group III animals attained the approximate degree of healing (that is, the same degree of calcification) by the thirtieth postoperative day as Group I animals attained in 35 or 36 days (Fig. 4,B). Roentgenograms taken on the forty-second day revealed that unhealed areas, as indicated by noncalcified notch in the bone, were still present in the tibias of Group II animals cut with the ultrasonic device without coolant covering the cutting tip (Animal 2, Fig. 2,D). In contrast, roentgenograms of the tibias cut with an ultrasonic device whose cutting tip was covered at all times by flowing sterile saline solution (Animal 1, Fig. 2,D) showed relatively complete calcification of the cut area after 42 days. The cortical plate of bone was discernible in the cut area, although notches or indentations were often seen, indicating that the normal contour of the tibias was not completely restored at the time the animals were sacrificed. The cortical plates of the bone of the tibias cut with rotary burs bathed with sterile saline solution (Ani-

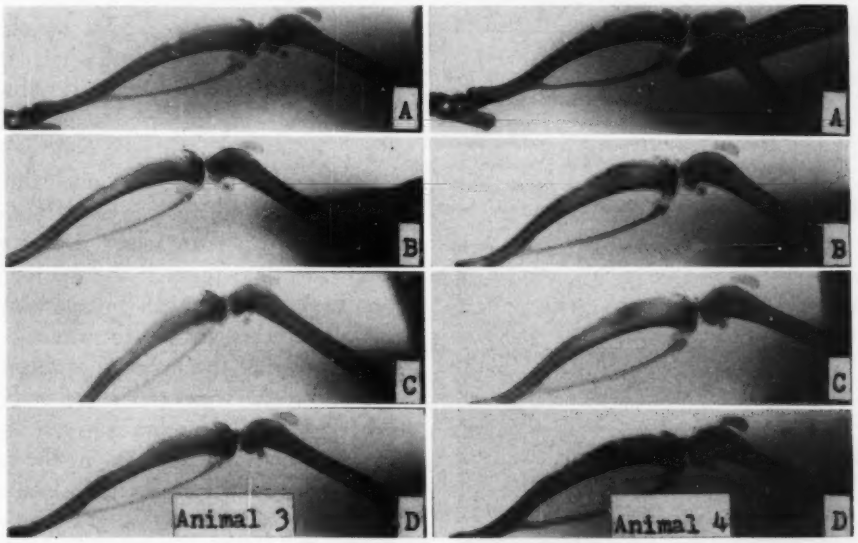

Fig. 3—Tibias of rats cut with rotary burs, with (Animal 3) and without (Animal 4) sterile saline solution bathing bur during cutting period. Roentgenograms were taken of each animal immediately postoperatively (A) and at 18 (B), 36 (C) and 42 (D) days. Healing, as evidenced by degree of calcification, appears to have progressed more rapidly when saline solution was used to cover bur (Animal 3) than when bur was used in a dry condition (Animal 4)

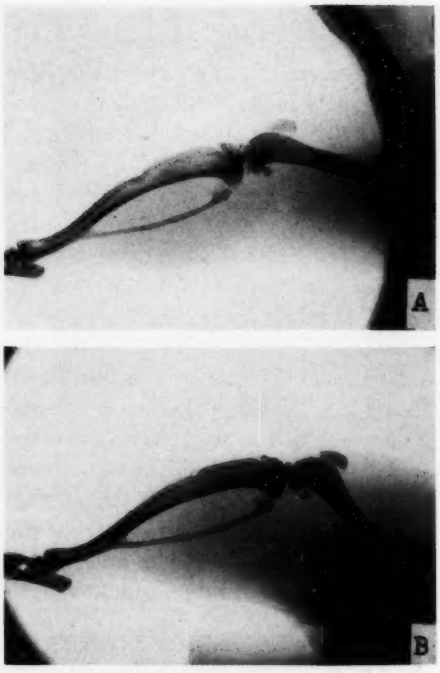

Fig. 4—Comparison of extent of healing, as evidenced by state of calcification, in Group I animals at 36 days and Group III animals B at 30 days. Degree of healing appears to have progressed more rapidly in tibias of Group III animals (rotary bur bathed in saline solution) than it did in Group I animals (ultrasonic scalpel bathed in saline solution)

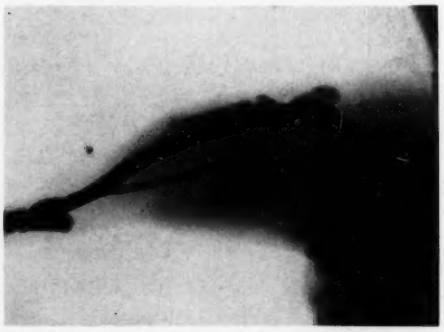

Fig. 5—Characteristic but small radiolucent area can be seen in center of cortical plate of bone of region cut with rotary bur covered with normal saline solution (Group III animals)

mal 3, Fig. 3,D) were more uniformly radiopaque than are the cortical plates of the tibias cut by the ultrasonic instrument whose tips were either bathed in sterile normal saline solution or used in a dry condition (Animals 1 and 2, Fig. 2,D). However, for some unknown reason, some of the cortical plates of the tibias cut with the rotary burs bathed in sterile, normal saline solution (Group III animals) had small radiolucent areas in the center of the new bone of the cut area even on the forty-second postoperative day (Fig. 5).

HISTOLOGICAL DATA—The histological findings of the tibias obtained on the forty-second postoperative day from the various groups of animals did not exactly parallel the roentgenographic findings. In Group I animals whose tibias were cut with the ultrasonic device utilizing saline solution to bathe the tip, the size of the calluses were usually somewhat larger than were those of Group II animals whose tibias were subjected to dry cutting tips (Fig. 6, 7). The new bone which formed in the cut area was much thicker when saline solution was used to cover the cutting tip than when it was not, often extending through the marrow almost to the opposite side. The periosteum was also thickened over the area of the cut. In some of the marrows of Group I animals, there were numerous cell-free areas (Fig. 6,A). In other marrows, there was a considerable increase in the cells and the sinusoidal spaces had decreased in size (Fig. 6,B).

In Group II animals whose tibias were cut with the ultrasonic instrument utilizing a dry scalpel, the results observed were similar to those of Group I

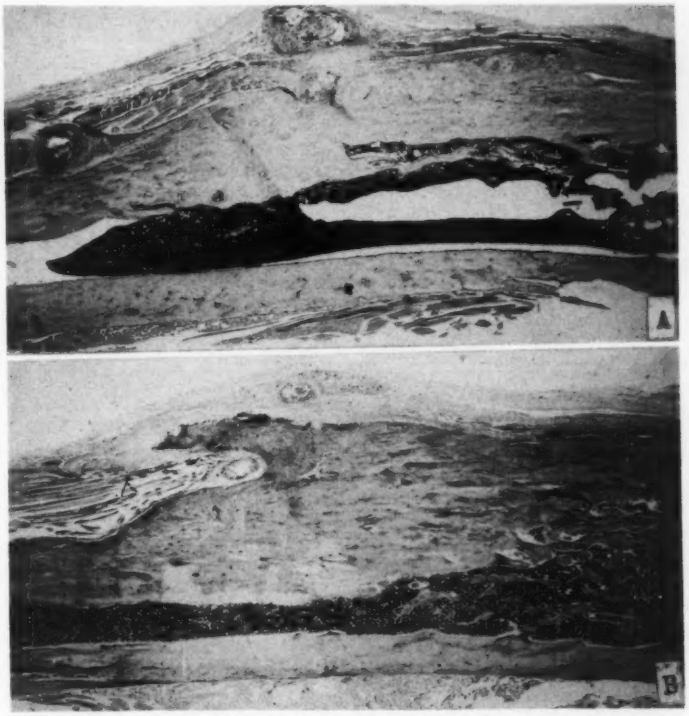

Fig. 6—Typical histological sections obtained 42 days postoperatively from two of the animals whose tibias were cut with an ultrasonic scalpel bathed in sterile normal saline solution (Group I animals). There is moderate amount of soft tissue reaction about the callus, and a moderately large callus, with new bone formation. In some instances, (A) the marrow reaction is moderately severe and in others it is not, but the marrow space is considerably reduced in width (B)

animals, except that the calluses at 42 postoperative days usually were not so large as with Group I animals but some of the tissue reactions appeared to be more severe (Fig. 7). The cell-free areas of the marrow were more numerous and larger in Group II animals than those of Group I animals. There also was some nonunion between new and old bone in Group II animals. In some instances, the necrotic edges of the cut bone stained darkly with hematoxylin and the edges were irregular, more so than in the bones of Group I animals.

In Group III animals, the cuts in the tibias made with a no. 559 carbon steel cross-cut fissure bur bathed in sterile saline solution were well healed by the forty-second postoperative day (Fig. 8). Although areas of new bone formation could still be distinguished, they were almost completely united with the adjacent, older bone. The osteocytes of the old bone adjacent to the new bone were present

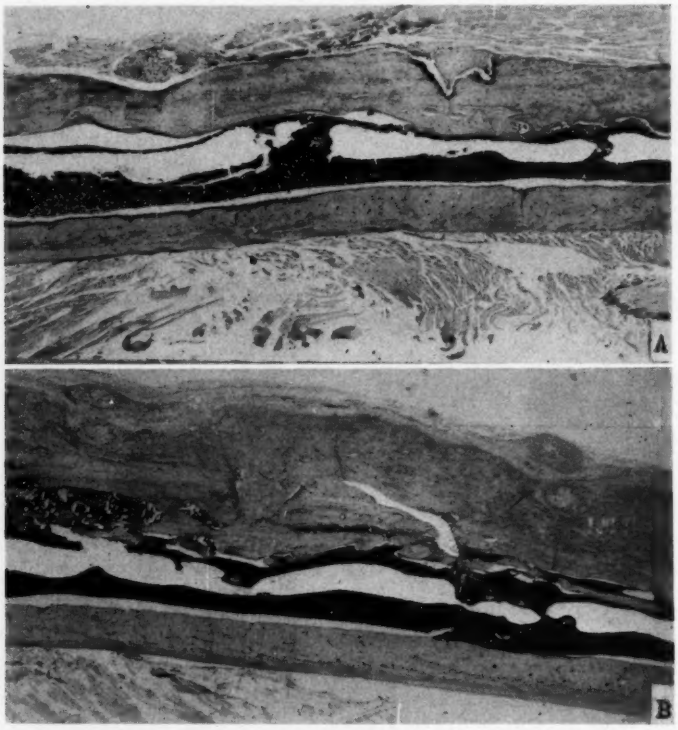

Fig. 7—Typical histological sections obtained 42 days postoperatively from two of the animals whose tibias were cut with a dry ultrasonic scalpel (Group II animals). The callus is moderate in size and healing has progressed but with some nonunion between new and old bone. Reaction in the marrow is severe, with the presence of cell-free areas

and apparently viable. The bone of the cut area was thickened and physiological reconstruction was in progress as indicated by the invasion of new marrow into the previous occluded marrow space. Many cellular elements were present in the marrow. There was an increased number of mature erythrocytes in the dilated sinusoidal space. There were no cell-free areas in the marrow in contrast to the many seen in the marrows of animals whose tibias were cut with the ultrasonic scalpel.

In Group IV animals, in which the tibias were cut with a dry no. 559 carbon steel cross-cut fissure bur, the condition of the cut area of the tibias was similar to the tibias of Group III animals, except that there were areas in the marrow which were devoid of cells (Fig. 9,A). Such areas were not always identical with the areas present in the marrow space of bone cut with the ultrasonic instrument, for they often consisted of a central cellular area surrounded by a cell-free zone. In some instances in which the tibias which were cut with rotary burs without sterile

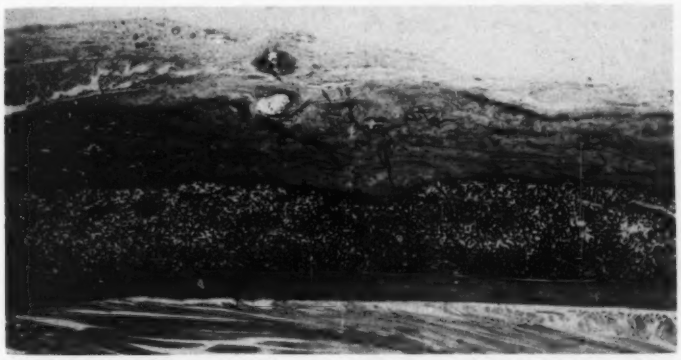

Fig. 8—Typical histological section obtained 42 days postoperatively from an animal whose tibia was cut with a rotary bur bathed in sterile normal saline solution. The soft tissue reaction is moderate and bone repair has progressed satisfactorily, although there are some areas of faulty calcification. Bone marrow appears to be essentially normal

saline solution (Group IV animals), the tissue reaction was severe and they were incompletely healed at 42 days, confirming the roentgenographic observations (Fig. 9,B). These calluses were rather large, there was incomplete or faulty calcification in the new bone of callus, with considerable irregularity, and in some instances new bone had not united with old bone.

■ *Discussion*

Roentgenographic and histologic observations of bone cut with the ultrasonic scalpel bathed in sterile saline solution indicated that the bone apparently healed at about the same rate as did bone which was subjected to the ultrasonic scalpel not bathed in sterile saline solution. The marrow seemed to be more adversely affected when the bone was cut with a dry tip than it was when it was cut with a wet tip. The difference in reaction was probably due to the dissipation of heat by the fluid, rather than by any differences in the physical characteristics of the cutting devices or to differences in the activity of the high frequency waves. When used under comparable conditions (that is, with and without sterile saline solution), bone cut with rotary burs usually healed more rapidly than did bone cut with the ultrasonic scalpel. In other instances, the reaction elicited in the bone and adjacent tissues with the dry bur was severe, particularly with regard to the callus and the marrow. Under these conditions, the differences in the response of the tissues could have been caused by differences in heat production or by the activity of the ultrasonic waves; at any rate, the data obtained are not sufficient to indicate the specific mechanism involved. Also, some difference was noted in the reactivity of adjacent tissue and in the healing rate of bone when cut with burs which were either bathed in sterile saline or used without saline. Here the difference in tissue response could have been caused by the production and lack of dissipation of heat.

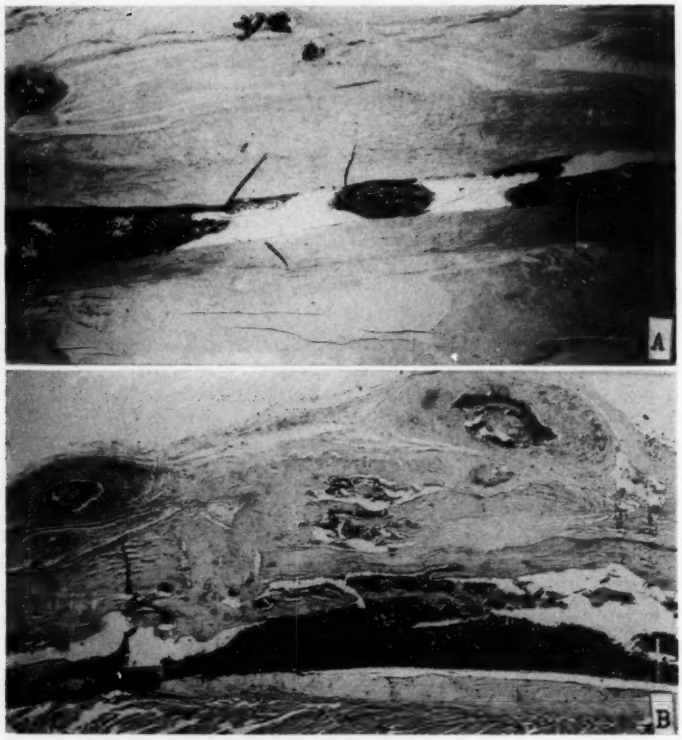

Fig. 9—Typical histological sections obtained 42 days postoperatively from two of the animals whose tibias were cut with dry rotary burs. In (A) bone healing appears to be normal but there are large all free areas. In (B), which is typical of a number of tibias of this group of animals, the adjacent soft tissue reaction is severe, the new bone is very irregular and there is faulty calcification of some areas

Although differences were noted in the tissue reaction and healing rate of bone cut with an ultrasonic device or rotary burs, nevertheless, in most instances, the cut area of bone had healed satisfactorily by the end of the experimental period (42 days). In some instances, therefore, it would be advantageous and satisfactory to use the ultrasonic device for bone surgery, provided that a satisfactory coolant is used to dissipate the heat.

■ *Summary*

A comparison was made of the adjacent tissue reaction and the healing rate of the tibias of adult white rats when cut with an ultrasonic scalpel and rotary burs, either when bathed with sterile normal saline solution or used in a dry condition without additional fluid. In the case of the ultrasonic instrument with saline solution, the bone and tissue reaction was more severe than without saline; without saline solution, the marrow reaction ap-

peared to be more severe. When the bone was cut with rotary burs, the reaction was less severe with saline solution than without. Without saline solution the marrow reaction was severe, and in some instances healing was irregular and calcification of new bone was incomplete or faulty.

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■ Into Literacy

All over the world, but especially in Africa and Asia, millions are stumbling out of illiteracy into literacy. Nations, new to the excitements and the responsibilities of independence, and eager to establish economic and social health, are attempting to compress into one generation the processes which Western Europe has achieved only after four hundred years of gradual development. This is a moment of magnificent opportunity for the printed word, but it is also a moment of crisis, for the chance is presented against the background of rapid development by other and more facile methods of communication. If our generation cannot persuade its newly educated into becoming readers, then it is more than possible that future generations will turn for their enlightenment and entertainment to viewing and listening rather than to reading. The new nations are determined upon literacy; for reasons which are both selfish and unselfish the established nations must join in the struggle, for the printed word, still the most persuasive, influential and permanent method of mass communication, is more than an end in itself. It is the way to trade, to political persuasion, to touching the minds, the hearts—and the pockets of millions.—*J. E. Morpurgo, Paper Backs Across Frontiers, 1960.*

Inflammatory papillary hyperplasia

■ *Daniel E. Waite,* D.D.S., M.S., Iowa City, Iowa*

Inflammatory papillary hyperplasia is a condition of the palatal mucosa usually due to some form of denture irritation. The fact that these papillary lesions may be premalignant warrants biopsy. The biopsy findings will determine the choice of surgical procedures to treat the condition.

Surgical treatment of this condition is described which includes leaving out the dentures for a period and either removing the entire mucoperiosteum or using electrosurgery. One case is reported that was treated by removal of the entire tissue mass, which showed early malignant changes.

Inflammatory papillary hyperplasia is a condition involving the palatal mucosa in those persons wearing some type of removable prosthesis—either a complete denture or a partial denture with palatal coverage. The etiology of this tissue change is unknown, but is thought by some to lie in an over-accentuated "relief area" combined with denture movement.[1] I have noticed a marked anteroposterior shift to the denture in all instances of this condition. The lesions usually can be traced to some form of denture irritation.

The lesion assumes a papillary configuration that is noticeably red and sessile, with the surface being referred to as "raspberry-like." These elevations vary as to surface area and depth. They can best be visualized by directing a stream of air on the lesion;[2] this procedure separates the papillae. Usually, food accumulation, oral secretions and, in general, unhygienic debris can be found at the base of the lesion. This debris, of course, only increases the tenderness and general inflammation. The condition has been seen to encompass the entire vault, extending to the soft palate and post-dam region and involving the lingual aspects of the alveolar ridge; however, it is usually restricted to the confines of the maxillary arch and basically over the relief area of the denture.

Most investigators still agree that tissue irritation remains a leading cause of carcinoma. Whether the cause is heat, coal tars, pecans, snuff, a jagged tooth or an ill-fitting denture, it still constitutes tissue irritation. Hobaek,[3] reporting 50 cases of carcinoma of the hard palate, found 33 patients wearing dentures, and in 21 instances believed denture irritation to be a direct contributing factor in the malignancy. Archer[4] reported a case of squamous cell carcinoma that developed in a region of hyperplasia as a result of a poorly fitting denture.

Robinson[5] was impressed by the

malignant potential of papillary lesions and advocated their removal and the microscopic examination of the excised tissue.

Treatment of inflammatory papillary hyperplasia varies with the malignant potential of the biopsy findings and the surgeon's choice of surgical procedures. There is no question as to the decrease of inflammatory response and edema when the prosthesis is removed; however, there is a limit to how long the removal of the appliance can be justified. Undoubtedly there is a point at which continued removal of the prosthesis is of no increased value. If the lesion is truly hyperplastic and therefore an actual increase in the number of individual cells, it would seem that the tissue could not be expected to return to its original architecture. However, tremendous improvement in the reduction of edema and the acute inflammatory reaction will be noted when the prosthesis is removed for three to five days. If surgery is to be carried out, a much better surgical field will be present after this period than when the operation is performed immediately upon removal of the ill-fitting denture.

A more accurate impression of the tissues and construction of an appliance which increases pressure directly over the vault is another possibility for treatment. This procedure would utilize the principle of tissue atrophy, but seems to lack considerably as a therapeutic measure.

Surgical removal appears to be the present treatment of choice. Complete surgical excision can best be done by extending the incision to bone and stripping free the entire lesion, including the periosteum. If any question of neoplasia or concern regarding bony involvement is anticipated, fulgeration of the exposed bone surfaces can be done. This, of course, assures complete removal; however, regeneration of the tissues in the vault region takes a considerable length of time, approximately eight to ten weeks. However, this disadvantage is minimized if a preconstructed clear acrylic splint is utilized. The splint should cover the entire vault, and sufficient free space should be provided for the formation of granulation tissue. The clear splint then provides for good visualization of the exposed palatal region during the postoperative period. This visualization is important, as pressure areas and increased granulation tissue formation can be observed and corrected if necessary.

Dressings or surgical ointments rarely are necessary. However, if the surgeon wishes to place a surgical ointment, antibiotic paste or obtundent drugs on the exposed bone, it is extremely convenient to do so when utilizing the surgical splint. Improved oral hygiene and minimal mechanical irritation to the healing site result with the use of the splint. It has been noted that postoperative pain is remarkably lacking when a splint is inserted. It is permissible to utilize a splint with teeth in alignment, thus satisfying the esthetic requirements of the patient. After healing is complete, a new prosthesis should be constructed.

Electrosurgery should not be overlooked for equally proper handling of this condition. The loop can be used carefully and accurately to shave the desired portion of the lesion free from underlying tissues. This, of course, leaves the periosteum intact, and, therefore, regeneration and re-

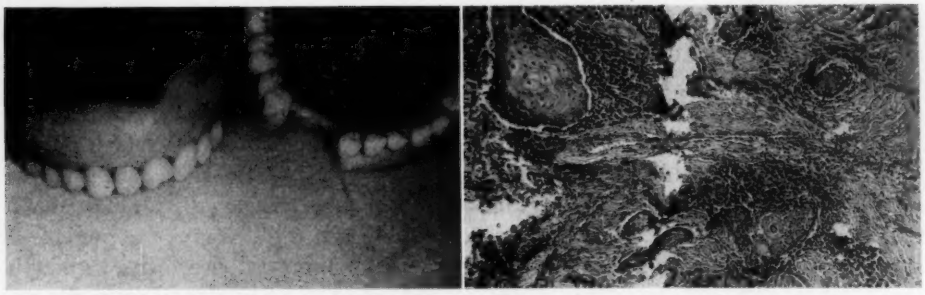

Fig. 1—Left: Original prosthesis. Note cutaway portion of lower denture which represents original lesion removed from crest of ridge. Right: biopsy tissue from lower right cuspid region of alveolar ridge

pair are more rapid. It should also be noted that sometimes tissue adjacent to surgically cauterized areas is more painful than when routine surgical methods are employed.

There are no statistics available on the relation between papillary hyperplasia and carcinoma. However, data have been referred to showing the relation between carcinoma and denture irritation. Therefore, since papillary hyperplasia is unquestionably related to denture irritation, there should be a concern for the possibility of neoplastic change.

■ *Report of Case*

In November 1957, a 55 year old white man appeared with the complaint of ill-fitting dentures. Routine examination disclosed a small, round lesion, 4 mm. in diameter, located in the lower right cuspid region on the crest of the mandibular ridge. The patient apparently had had a lower prosthesis constructed around the lower right cuspid and lateral incisor and then at a later date had these teeth removed without the construction of a new denture (Fig. 1, left). The lesion had a white center, was rather hard, and was slightly movable. The patient had experienced no pain and was unaware of the condition. Tissue in the region was excised for biopsy. The pathologist's report gave a diagnosis of early squamous cell carcinoma with suggested infiltration (Fig. 1, right). A wider excision at the original biopsy site was performed with microscopic confirmation that the lesion was removed adequately.

At the same time a lesion in the palate was noted and diagnosed clinically as inflammatory papillary hyperplasia (Fig. 2, left). The lesion covered the entire vault region, extending back to the soft palate in the denture-bearing region. The region was red, inflamed and papillary in nature. Tissue was taken for biopsy, and the pathologist's report (from the department of stomatology, State University of Iowa College of Dentistry) contained the following:

> The specimen presented a grossly discernible papillary configuration. The surface was covered with poorly keratinized, hyperplastic, stratified squamous epithelium. The rete pegs were branched and elongated, whereas the stratum papillare of the underlying connective tissue was heavily infiltrated with lymphocytes, plasma cells and histiocytes. A clearly defined

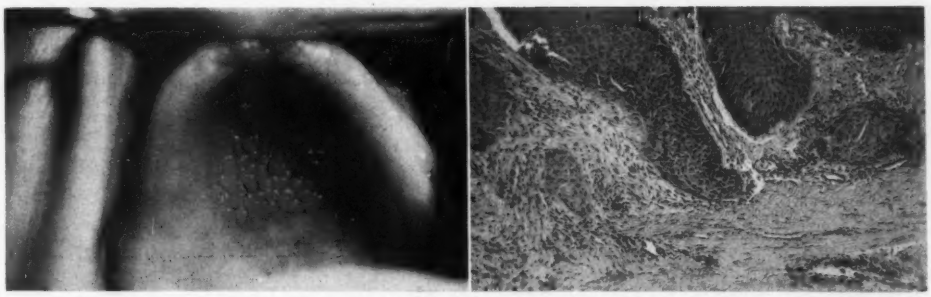

Fig. 2—Left: Configuration of maxillary lesion. Right: Photomicrograph of biopsy tissue from palatal lesion showing early neoplastic change

basement membrane could not be distinguished in all areas, although some areas were masked by the heavy leukocytic infiltration. The lamina propria was composed of dense collagenous connective tissue slightly infiltrated with lymphocytes and showed moderate edema. The submucosa contained fat cells and normal appearing glands. There was a discontinuity of the basement membrane, anisocytosis in the basal layers of the epithelium, marked branching of the rete pegs and a suggested epithelial whorl formation deep to the basal layer of epithelium.

The diagnosis was inflammatory papillary hyperplasia with possible early neoplastic changes (Fig. 2, right).

Laboratory examination of blood and urine showed that all the results were within the normal ranges, with bleeding time slightly prolonged, slight leukocytosis, and slight elevation of the erythrocyte sedimentation rate. These findings were compatible with chronic inflammation.

Treatment of choice was complete surgical removal of the entire tissue mass (Fig. 3, left), allowing time for healing and construction of satisfactory dentures. With the patient under local anesthesia and premedication with 0.3 mg. scopolamine and 100 mg. secobarbital sodium, the entire mass was removed and a surgical splint of clear acrylic placed over the region to protect it during healing (Fig. 3, right). The patient was seen daily postoperatively and had little pain or discom-

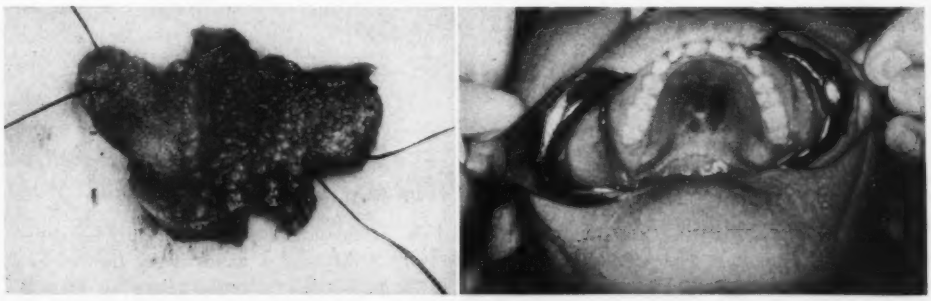

Fig. 3—Left: Excised lesion. Right: Postsurgical prosthesis (clear acrylic splint)

fort. New dentures were constructed, and the patient recovered uneventfully, but about three months was required for the palatal region to regenerate completely.

The patient was recalled for follow-up examination in September 1959. The palatal tissues were firm and had good color. The patient stated that he was completely comfortable and satisfied with the treatment. He previously had been made aware of his condition and will be followed with routine dental examination.

■ *Comment*

This case is reported because of the increasing frequency with which papillary hyperplasia is being seen. It is suggested that this lesion should be included in the so-called premalignant group of lesions. In the case reported, early neoplastic change was evident. It is now a routine procedure for this clinic to remove tissue for biopsy in all instances of papillary hyperplasia. If no neoplastic tendencies are noted histologically, then the treatment proceeds according to the methods discussed previously. If the lesion shows neoplastic change, then more attention must be given to complete removal, follow-up care and general physical examination for cancer detection.

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■ Free Society

The free society is still the exceptional society, and the world is still full of people who believe that men need masters. The survival of the idea for which this nation stands is not inevitable. It may survive if enough Americans care enough. *Life Magazine. The National Purpose. John W. Gardner. Chicago Daily News June 25, 1959.*

Use of a new improved hemostatic sponge in oral surgery

■ *N. Georgiade, D.D.S., M.D.; T. Mitchell, D.D.S.; J. Lemler, D.D.S., and J. Heid, D.D.S., Durham, N. C.*

A new surgical hemostatic agent is described. Both animal experimentation and clinical evaluation proved it to be a useful adjunct in obtaining hemostasis after various oral surgery procedures. The material is soft, easily handled, and readily adaptable to any type of surface. It has an affinity for hemoglobin which results in the formation of a gel when in contact with the blood in a pH range of 3.5 to 4.5.

After the material was evaluated on laboratory animals which after 21 days showed no foreign body reactions, it was used on 736 patients after various oral surgery procedures. No untoward effect was noticed and bleeding was controlled easily in all instances.

Success in managing many dental and oral surgical problems postoperatively depends to no small degree on obtaining adequate hemostasis during the surgical procedure. In the past few years newer hemostatic agents have become available which have greatly improved our handling of patients in instances of multiple extractions or removal of impacted teeth, cysts, biopsy tissue and so forth.

Various so-called absorbable sponges, such as cornstarch,[1,2] gelatin,[3-6] or oxidized cotton[7-9] sponges, and absorbable bone wax[10] have been used with varying degrees of success. Although these sponges have been described as absorbable, reports from various investigators reveal that some may take as long as 90 days to be absorbed.[1,3,5,6] The probability of obtaining a foreign body reaction with delay of healing at the surgical site is a consideration that must be weighed by the surgeon when using these sponges for their immediate effect at the time of surgery.

During the past year a new absorbable hemostatic surgical packing material (Surgicel) has been available to us for clinical and laboratory evaluation. This surgical packing material, prepared from regenerated alpha cellulose with a uniform molecular weight lower than that of cotton and available in an oxidized form, was used in two forms—either as a fabric or as a knitted strip (Fig. 1). This oxidized cellulose material is prepared by the manufacturer in a uniform molecular size and weight insuring a uniform and predictable rate of absorption when implanted in the tissues. Because this material was soft and easily adaptable to any

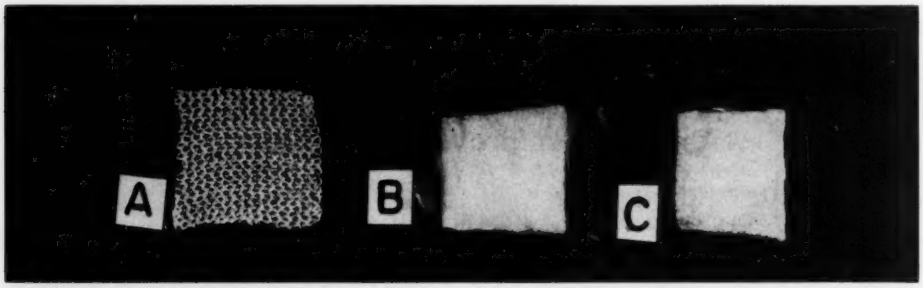

Fig. 1—Three types of Surgicel used. Type A was easiest to handle; however, types B and C were packed loosely in cystic regions and after removal of deeply impacted teeth

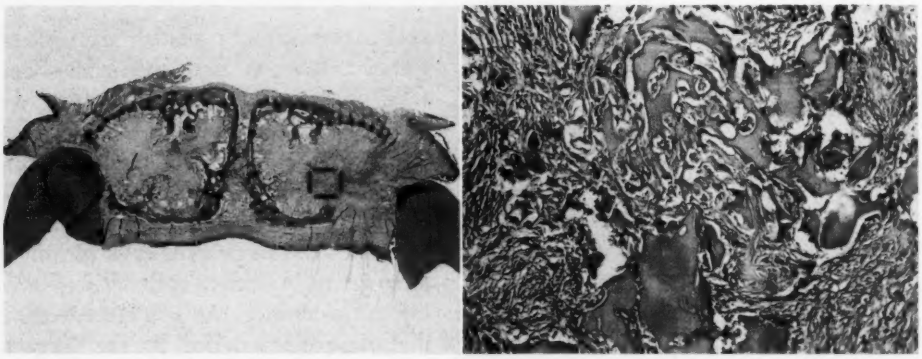

Fig. 2—Left: Low magnification of symphysis of dog ten days after insertion of hemostatic agent. Area outlined in black shown in high magnification at right. Right: High magnification reveals large pieces of hemostatic gauze with some absorption and infiltration of capillaries and fibroblastic proliferation

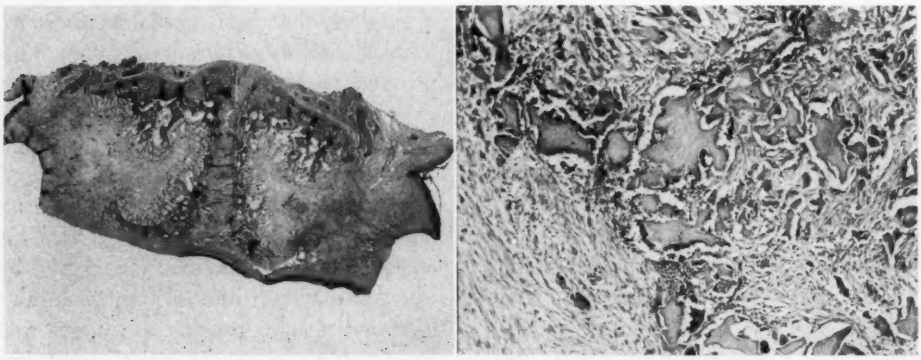

Fig. 3—Left: Low magnification of symphysis of dog at 14 days. Note considerable decrease in area of hemostatic gauze. Right: Higher magnification of view at left reveals further increase of resorption of other gauze with increased capillary penetration and fibroblastic infiltration

Fig. 4—Left: Low magnification of symphysis of dog at 20 days. Note complete absorption of hemostatic gauze. Right: Higher magnification showing outlined area of view at left reveals that complete resorption has taken place with osteogenesis in progress

Fig. 5—Left: Maxillary cystic cavity shown before and during loose filling of cavity with hemostatic gauze. Right: Labial flap sutured tightly over defect

Fig. 6—Left: Postoperative view after multiple extractions and alveoloplasty. Center: Loose packing of tooth sockets with woven hemostatic gauze. Right: Operative site after suturing of extraction and alveoloplasty wounds. Note excellent hemostasis

type of surface, it could be handled readily by the usual methods, usually with the aid of a tissue forceps. This oxidized regenerated cellulose dressing is a polyanhydrogluconic acid with an affinity for hemoglobin resulting in the formation of a gel with the blood in a pH range of 3.5 to 4.5.

■ *Method*

Initially a series of extractions (50) were performed on laboratory animals (rats) and the sockets were covered with Surgicel, as well as with gelatin sponges. The laboratory animals were sacrificed in three-day periods serially, and histologic sections were obtained through the surgical sites, showing the gradual absorption of the hemostatic agent. The material appeared to be completely absorbed within a 21 day period with no foreign body reaction being noted throughout the series (Fig. 2-4).

After the initial laboratory evaluation of this hemostatic agent, 1,036 patients had this hemostatic surgical packing applied to bleeding areas. The hemostatic agent was used in the following instances:

Multiple extractions	338
Single extractions	333
Extractions in hemophiliac patients	6
Impacted teeth (1 or more)	210
Retained root tips	6
Alveoloplasty	36
Arthroplasty (temporomandibular joint)	2
Gingival hemorrhage	20
Dry socket bleeding	1
Postoperative hemorrhage	8
Excision biopsies	20
Removal of redundant tissue	1
Closure of oroantral fistula	1
Mandibular cysts	18
Maxillary cysts	10
Nerve transplant	1
Rhinoplasty	2
Radical neck dissection	6
Cleft palate repair	8
After removal of ossifying fibroma	1
Open reduction of fracture of mandible	3
After excision of carcinoma of mandible	4
Iliac bone graft site	1
Biopsy of tonsillar region	1
After removal of submaxillary gland	1
Meniscectomy	2
Maxillectomy	2

No untoward effect from this material was noticed postoperatively, and bleeding was controlled easily. This material is now being used routinely for all impactions as well as in any bleeding regions that are of concern in removal of cysts or after multiple extractions and alveoloplasties (Fig. 5, 6).

■ *Summary*

A new, readily absorbable, oxidized regenerated cellulose surgical packing material has been described that has been used experimentally and clinically. Rapid absorption qualities as well as satisfactory hemostatic qualities with ease of handling have been noted during our extensive clinical evaluation. It is believed that this material represents a useful adjunct in any oral surgical procedure necessitating maximum hemostasis.

From the Division of Oral Surgery, Duke University Medical Center.

The Surgicel Absorbable Hemostat used in this study was supplied by Johnson & Johnson.

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Postoperative parotitis: a complication in a fracture of the maxilla

■ *Wilbur N. Van Zile,* D.D.S., Portland, Ore., and Homer S. Samuels,† D.D.S., St. Albans, N. Y.*

Postoperative or nonepidemic parotitis has increased in incidence in the past several years and appears to have done so primarily since the advent of antibiotic therapy. Postoperative parotitis as a complication of maxillary fracture developed in a 32 year old man. The causative organism was coagulase positive hemolytic staphylococcus and was resistant to all the currently used antibiotics. Therapy consisted of surgical and local measures. Facial nerve paralysis was a secondary complication of the parotitis.

The term "postoperative" or postsurgical parotitis, although adopted in the literature, is not entirely descriptive and is somewhat misleading. The patient discussed herein had received no surgical treatment before onset of the parotitis. It would seem that nonepidemic parotitis, surgical parotitis, suppurative parotitis or some such descriptive term might be more applicable.

People who have a great number of systemic pathologic conditions develop surgical parotitis as well as persons who are otherwise healthy. It has been called "sympathetic" parotitis because it is known to have occurred after injuries to the testes and after slight genitourinary tract manipulations such as passing sounds or catheters. It has also developed after operations involving the ovary, uterus, stomach, intestine, and a host of other general surgical procedures as well as after dental extractions and pharyngitis. An example of sympathetic involvement of the testes is that which follows epidemic parotitis on occasions.

Hippocrates[1] first described epidemic parotitis, not surgical parotitis, and suggested its epidemic nature and testicular complications. However, surgical parotitis

is neither epidemic nor does it involve the testes.

Anesthetists frequently find minor parotitis postoperatively in patients who have had general anesthesia.[1] It probably occurs much more often than is reported since symptoms may be minor in comparison to other postoperative complaints and the condition usually clears spontaneously.

Many authors have written concerning postoperative parotitis. Four theories of causative factors have been discussed in the literature: (1) retrograde transmission of oral bacteria via the parotid duct (Anspach and Griffeth[2] reported that in the application of certain metallic drugs to the mouth, enough radiopaque material passed into the ducts to demonstrate the major ducts roentgenographically); (2) blood-borne transmission of organisms to the gland; (3) lymph-borne transmission of organisms to the gland; and (4) direct extension from trauma or pathologic condition.[1,3] However, there is no majority agreement on the pathogenesis.

It is agreed by many authors that xerostomia is frequently a predisposing factor in surgical parotitis which may result from "oral starvation" in tube-fed patients, limitation of motion of the muscles of mastication,[3] and drug or chemical reactions. However, if limiting the movement of the muscles is predisposing, many more instances should occur during routine interdental immobilization of facial fractures.

Many varieties of bacteria have been cultured from the parotid ducts and from drainage material. Generally, as would be expected, strains of staphylococcus and streptococcus are the offenders. Shklair and co-workers[4] determined the occurrence of pathogenic strains of staphylococcus in whole salivas of normal individuals and in salivas of persons with various forms of periodontal disease. Coagulase-positive staphylococci were isolated from 39 per cent of patients with Vincent's infection, 46 per cent of individuals with gingivitis and 39 per cent of persons with normal oral tissue.

The following list gives the incidence of postoperative parotitis in various institutions and groups throughout the country: 2 cases in about 7,000 or an incidence of about 1:3,500; 3 cases in about 6,825 or an incidence of about 1:2,270; 8 cases in about 6,000 or an incidence of about 1:762; 13 cases in about 2,716 or an incidence of about 1:209; 9 cases in about 13,000 or an incidence of about 1:1,450.

A striking fact in one study[1] was the complete absence of parotitis among 21,514 obstetrical patients and in the newborn. All instances occurred before the era of antibiotics and chemotherapy.

A study by a San Diego group[5] states that the incidence has risen twelvefold since the advent of antibiotics and the subsequent mass sensitization of bacteria to such agents.

Treatment in the case to be discussed was complicated by the presence of the coagulase-positive hemolytic staphylococcus which is so prevalent and so difficult to control in many hospitals today.

■ *Report of Case*

A 32 year old well developed Caucasian man weighing 160 pounds was admitted to the Naval Hospital, St. Albans, N. Y., on Sept. 2, 1958 because of a swollen face.

The patient stated that he had been injured in a fight the day before. He stated that he had experienced the usual childhood diseases; he had had "cat-scratch" fever in 1943; his mother and one sister were living and well and his father had died from cancer. There was no family history of diabetes or tuberculosis.

Physical examination on admission, including neurologic examination, revealed no abnormalities except the facial injuries to be described. Oral examination revealed a full adult dentition in a good state of health. There was a right side cross-bite. The maxilla was slightly mobile and gave a clinical impression of a pyramidal-type fracture. The maxillary teeth elicited a dull note on percussion. Both nares were packed with gauze and the physician in attendance on the night of admission stated that he had experienced difficulty in controlling nasal hemorrhage. Periorbital edema, ecchymosis and conjunctival hemorrhage were present with no evidence of diplopia. The frontal bone was depressed slightly over the frontal sinus area. The mandible appeared uninjured and there were no intraoral lacerations.

Roentgenographic examination confirmed the diagnosis of a pyramidal-type fracture of the maxilla with antral fluid accumulation bilaterally. The frontal bone was depressed slightly in the lateral film. There were no other facial or cranial fractures. Sphenoid, ethmoid, and frontal sinuses appeared normal. A chest roentgenogram was reported as normal.

Admission laboratory examinations including hematologic and serologic and urinalysis were negative or within normal limits. The white blood cell count was 10,300 with a 65-30 Schilling distribution.

Tests for cerebrospinal fluid were not considered to be reliable in the presence of epistaxis.

■ *Course and Treatment*

At the suggestion of the neurosurgeon, the patient was placed on tetracycline for five days because of the possibility of a skull fracture in the region of the cribriform plate.

On Sept. 5 the nasal packs were removed and on Sept. 8 continuous loop wiring was applied to maxillary and mandibular teeth and intermaxillary elastics were used to reduce and immobilize the maxilla to the mandible in centric occlusion. A rubber dam chin strap suspended from a cloth scrub cap was used to antagonize inframandibular muscle pull. By Sept. 10, reduction was satisfactory. The teeth occluded in their usual facets of wear.

The only complaint of the patient during the next ten days was a feeling he described as "light-headed" which gradually diminished in a few days.

On Sept. 22 the intermaxillary elastics were removed but the rubber dam chin strap was continued. On Sept. 23 (twenty-first hospital day) the patient complained that for two days he had experienced an uncomfortable feeling in the right preauricular region.

Examination revealed a warm, tender, somewhat raised region just anterior to the right temporomandibular joint and over the upper pole of the parotid gland (Fig. 1, left). His oral temperature was 101° F.

Fig. 1—Left: Second day of pain, tenderness and swelling of right parotid gland. Right: Day after preauricular incision and placement of rubber dam drain

Fig. 2—Purulent material draining from Stensen's duct

A tentative diagnosis of an infection similar to "postoperative" parotitis was made. Empirical antibiotic therapy and a moist heat program were begun. Erythromycin and sulfisoxazole were selected on the strength of favorable results reported by groups at other hospitals.[5,6] A blood amylase assay was ordered and was reported as 284 units diastatic activity (150 units is considered upper normal according to the Somogyi technic).

On Sept. 25 there was no improvement and, although there was no fluctuant region, swelling and lymphadenitis had increased and it was considered desirable to establish early drainage which was accomplished under general anesthesia (thiopental sodium, nitrous oxide-oxygen) through a preauricular incision. The incision was begun above the tragus and terminated inferior to the lower lobe of the ear (Fig. 1, right). By blunt dissection hemostats were carried through the capsule and into various planes of the parotid gland. Although no frank purulent material was encountered, a creamy film was seen on the instrument on withdrawal from the gland. This material was sent to the laboratory for culture and antibiotic sensitivity tests.

On Sept. 26 (first postoperative day and fifth day of parotid gland symptoms), the swelling was considerably increased, extending 5 cm. below the border of the mandible and to the infraorbital region. There was thick purulent drainage from the orifice of Stensen's duct for the first time (Fig. 2).

The laboratory reported the organism was coagulase-positive hemolytic staphylococcus, later identified as phage type 44a/81/80. Antibiotic sensitivity tests revealed the organism to be resistant to all currently used antibiotics. Slight inhibi-

tion by novobiocin and bacitracin was not felt to be clinically significant. The patient was moved from a ward to a private room and strict isolation and quarantine measures were employed to prevent spread of the organism within the hospital.

A consultation was requested with the antibiotic control board of the hospital. It was recommended that ristocetin (Spontin) be employed as a treatment agent since it had been effective in this hospital in the treatment of staphylococcal pneumonia caused by the same or similar organism.[7,8] Ristocetin therapy was started immediately. One gram in 125 cc. of 5 per cent glucose in water was administered intravenously twice daily. The dosage was based on 28 mg. of ristocetin per kilogram of body weight. The drug is a severe irritant and therefore each injection was followed by 250 cc. of 5 per cent glucose in water to wash the vein.

By Sept. 27, the patient's temperature was stabilized around 101° F. The infraorbital swelling had decreased but there was additional swelling and lymphadenitis extending downward into the neck and toward the midline. Although a 10 cm. rubber dam drain had been looped around the parotid fascia for drainage, the region continued to ooze rather than drain in spite of continuous moist heat applications.

On Sept. 28 the patient began to complain of excruciating ticlike paroxysms of pain in the immediate region and generally on the right side of the head, and his reactions were hypersensitive to noise and light. The symptoms prevailed for the following four days. Efforts to control the intense cephalalgia included the use of meperidine 100 mg. combined with 25 mg. promethazine hydrochloride, dextro propoxyphene hydrochloride, aspirin, phenobarbital, APC's, pyrrobutamine compound and finally morphine sulfate in various combinations. There was little drainage and what there was appeared semicaseous. The swelling was stable but not improved. The temperature remained at 100° to 101° F.

Consultations with the ear, nose and throat department at this time ruled out involvement of the middle ear and pharynx.

On Oct. 1 the patient was started on buccal streptokinase-streptodornase, 1 tablet four times daily, in an effort to reduce the viscosity of the drainage material.

On Oct. 2 approximately 10 cc. of thick caseous pus was expressed through the drainage wound. An irrigation program was begun using solutions of hydrogen peroxide, saline solutions, streptokinase-streptodornase and bacitracin alternately. Paresis of the right side of the face was developing (Fig. 3, left) and the patient complained of a loss of taste bilaterally.

On Oct. 3 a fluctuant region was noted 3 cm. inferior to the angle of the mandible. The patient complained of dysphagia. He was again anesthetized (thiopental sodium, nitrous oxide-oxygen), and through a 3 cm. skin incision a digital exploration was made of all aspects of the abscess. The abscess cavity extended around the angle of the mandible and upward along the inferior and posterior aspects of the internal pterygoid muscle for a short distance. Approximately 30 cc. of a thick caseous material was evacuated and a through and through fenestrated

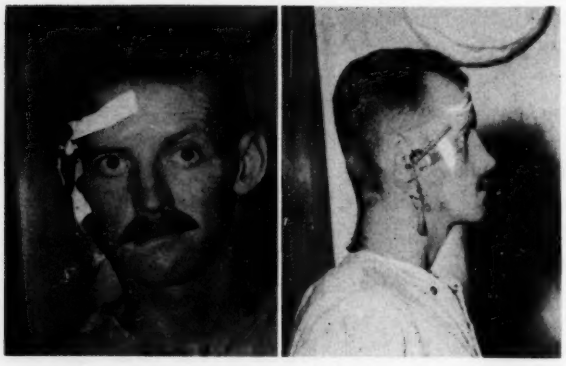

Fig. 3—Left: Twelfth day of illness. Fenestrated catheter and Penrose drains in parotid gland region for drainage and irrigation. Note facial nerve paralysis at right eye, corner of mouth and forehead. Right: Side view showing preauricular and submandibular draining points

catheter was inserted from the previous incision to the new dependent drainage point. Penrose drains were placed in both incisions (Fig. 3, right) and the patient was continued on the streptokinase-streptodornase and bacitracin irrigation program. By evening his temperature was 103° F.

The patient showed considerable improvement the following morning and was free from pain for the first time, but seventh nerve function was almost completely lost. Improvement continued and on Oct. 7, the fourteenth day of the parotid infection, his temperature was normal and drainage slowly decreased. Antibiotic therapy was changed from intravenous ristocetin to oral novobiocin.

During the acute phase the white blood cell count remained between 16,000 and 25,000 with approximately 80 segmented forms, 8 bands and 8 to 12 lymphocytes. The platelet count and blood urea nitrogen remained within normal limits and fluid intake and output were controlled.

Recovery from the acute phase of the disease was uneventful. The drains were removed at the appropriate time, granulation proceeded as usual, and the wounds closed with minimal scarring. The patient was then started on physiotherapy consisting of heat, massage, exercise and electric stimulation to maintain muscle tone while awaiting hoped for regeneration of the facial nerve branches.

■ *Discussion*

The course followed in this acute illness did not differ in severity and length from that followed in the preantibiotic, prechemotherapeutic era in spite of vigorous antibiotic therapy. Early incision for drainage was instituted, but drainage was almost nonexistent because of the thick, caseous nature of the purulent material. After incision of the second fluctuant region which appeared at the lower pole of the gland, additional purulent material was expressed rather than drained. Only after local irrigation with streptokinase-streptodornase did the purulent material drain freely.

Whether ristocetin actually aided in the resolution of this phlegmon can only be conjectured. A fluctuant region for adequate incision was anxiously awaited and when it appeared on the eleventh

day of the acute illness, it was entered and the patient improved rapidly. It is possible that antibiotic therapy helped localize the infection during this period but it was thought this was questionable.

The involved organism was identified repeatedly as one of the resistant strains of coagulase-positive hemolytic staphylococcus which has been encountered in so many hospitals as a result of mass antibiotic therapy. The problem has been the object of intensive research and study by the medical staff of St. Alban's Hospital as reported by Calvy and Schumacher.[7,8]

Comprehensive steps have been taken by the hospital antibiotic control board and the hospital staff as a unit to combat the problems arising in connection with this resistant strain.

It was obvious that the facial nerve was impaired by the toxic phlegmon or a pressure phenomenon based on edema, or by both, and not as a result of a surgical procedure since the facial paralysis was preceded by gradually increasing weakness even before incision for drainage.

The muscle tone on the affected side was maintained with galvanic stimulation while awaiting regeneration.[9] Lathrop states, "Satisfactory contraction of the muscles when stimulated by a galvanic current indicates that voluntary movements of the face should be obtained if the anatomic and physiologic continuity of the facial nerve can be restored."[10]

■ *Results*

By the middle of December the muscles supplied by the most proximal branches of the nerve, that is, the forehead and corners of the eye, could be stimulated. The patient was encouraged to practice muscle movements in front of a mirror and the function of the distal movements around the mouth returned almost dramatically to a state estimated at approximately 75 to 80 per cent of normal on his discharge from the hospital in the middle of January. This should have been the expected time interval for repair in view of the widely accepted fact that the rate of growth of a regenerating neuraxon is close to 1 mm. a day, or roughly 1 inch per month.[11]

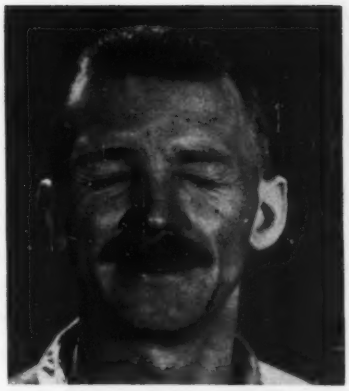

Fig. 4—Facial muscle function on day of discharge, three and a half months after onset of parotitis

Loss of taste persisted for only three or four days and since it was bilateral, was probably due to the diet, variety of medications or toxic condition. The only other sequela of this very acute illness was latent involvement of the inner ear. Hearing was normal but the patient complained of vertigo for about two months after recovery. Audiometric tests were normal but caloric tests of the labyrinth revealed impairment of equilibrium.

On discharge from the hospital, the vertigo had disappeared completely, the

maxillary fracture appeared firm, occlusion and jaw relations were normal, salivary flow from Stensen's duct returned and the buccal mucosa appeared well bathed.

Although on close examination, facial nerve weakness was present, the patient could wrinkle his forehead, close his eye, smile and protrude his lips (Fig. 4). He is being followed as an outpatient to observe any further changes in facial nerve function.

■ *Summary*

A patient was seen in whom suppurative parotitis occurred on the twenty-first day after a traumatic injury. The causative organism was an antibiotic resistant coagulase-positive hemolytic staphylococcus.

Involvement of the facial nerve with loss of function of the muscles of facial expression and impairment of function of the inner ear were sequelae. The patient regained normal facial nerve function in about three months.

The opinions or assertions contained herein are the private ones of the writers and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

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■ Life and Death

An individual human existence should be like a river—small at first, narrowly contained within its banks, and rushing passionately past boulders and over waterfalls. Gradually the river grows wider, the banks recede, the waters flow more quietly, and in the end, without any visible break, they become merged in the sea, and painlessly lose their individual being. The man who, in old age, can see his life in this way, will not suffer from the fear of death, since the things he cares for will continue. And if, with the decay of vitality, weariness increases, the thought of rest will not be unwelcome. I should wish to die while still at work, knowing that others will carry on what I can no longer do, and content in the thought that what was possible has been done.—*Bertrand Russell, Portraits from Memory and Other Essays.*

Healing of surgical extraction wounds in macacus rhesus monkeys III. Effect of removal of alveolar crests after extraction of teeth by means of forceps

■ *Harold E. Simpson, M.D.S., Newcastle upon Tyne, England*

There is no evidence to indicate that healing in the apical portion of the alveolus after tooth extraction is influenced by reduction in the height of the alveolar crests. Regeneration of these crests when removed is not seen to occur. However, a more satisfactory healing of the superficial part of the socket can be obtained by removal of the alveolar crests. This improvement is only evident after the first two weeks and maintained for another two weeks. After one month any extraction technic utilized will produce an equivalent result.

Clinical evidence shows that progressive resorption of the alveolar process occurs after the extraction of teeth. This resorption takes place in two stages. First there is a rapid remolding of the bone to produce the smooth contour that is generally considered an indication that permanent dentures may be constructed. This process usually occupies three to six months in human beings. The second stage probably follows directly upon the first and, although much slower and varying considerably in degree in different individuals, appears to continue throughout the remainder of life.

Since the first stage of resorption is concerned with the rounding off of the corners of the trapezium-sectioned ridge produced by the filling in of the socket with new bone to the level of the alveolar crests, it could be argued that operative reduction in height of the alveolar crests would accelerate the production of a stable condition. By reducing the depth of the socket and consequently the volume of the blood clot, the time required for ossification of the socket contents might also be shortened.

A series of experiments was designed to examine these points. Flaps were reflected on the labial and lingual aspects of teeth which were then extracted with forceps, and the labial and lingual crests were reduced by about one third of their height by means of bone forceps. The flaps were sutured over the socket. Seventeen teeth were extracted and 11 animals

Fig. 1—Three day old wound showing effect of bone forceps on labial alveolar crest. Irregular bone fragments are surrounded by large numbers of inflammatory cells

were employed. Specimens were prepared to demonstrate the healing processes at intervals extending from three days to eight weeks after extraction.

■ *Experimental Results*

At three days the gingival margins projected over the alveolar crests, but there was a wide gap between them filled with an inflammatory exudate which extended apically a short distance below the level of the crests before being replaced fairly abruptly by the normal blood clot. Irregular bone fragments were seen above the crests (Fig. 1) and a few had fallen into the blood clot in the socket where they appeared at this point to be well tolerated.

At one week there was a considerable epithelial defect over the center of the socket. The superficial part of the organizing blood clot showed a moderate infiltration by inflammatory cells, and a fibrinous exudate was present on the surface. Bone fragments were not numerous, and the degree of inflammation associated with them was slight. There was a little osteoclasia of the crests, but in most places a layer of new bone was being deposited on them.

At two weeks (Fig. 2) the flaps had united firmly, and a few inflammatory cells were present in the connective tissue below the point of union. Bone fragments were few and generally were undergoing osteoclasia. In one instance a fragment near the internal crest was acting as a focus of ossification. The cut surfaces of

Fig. 2—Two week old wound. Epithelium is united and bone formation is well advanced. Note small number of bone fragments still visible near lingual crest

the crests were covered with a thin layer of new bone. One specimen showed superficial resorption of the external alveolar plate. The new bone in the socket, although level with the crests at the sides, was at a considerably lower level in the center.

At three weeks (Fig. 3) the socket was filled or almost filled to the level of the cut alveolar crests which themselves, however, showed no evidence of rebuilding other than the thin layer of bone deposited on them which was observed in the one and two week wounds. The external surfaces of the alveolar plates in one instance showed extensive osteoclasia. Bone fragments had been eliminated.

At four weeks the level of the bone in the socket was not materially different from that observed at three weeks. The external surfaces of the crests were being resorbed. In one specimen a fragment of bone was being exfoliated.

At six weeks the bone was beginning to condense on the surface. One specimen showed superficial resorption of the surface of the new bone. This may be associated with the reattachment of adjacent muscle fibers. Resorption of the crests and the plates of the alveolar process was of a minor degree.

At eight weeks the surface condensation of bone was more noticeable and the contour of the ridge appeared to have been established as a rather flat curve in a labiolingual direction. A somewhat more stable condition had been reached than in the other type of wounds of the same age, although resorption of the external alveolar plate continued to a small degree.

Fig. 3—Three week old wound. Bone has reached level of crests. External surface of labial crest is being attacked by osteoclasts

■ *Discussion*

There is no evidence in this or the preceding series of experiments[1-4] to indicate that the healing processes in the apical part of the socket are influenced by the treatment received by the bone during or after the removal of the tooth. The rate and mode of repair in that region are materially the same in all instances, even where the volume of the sockets has been reduced considerably by reduction of the height of the alveolar crests. In all the experiments the blood clot was still in evidence one week after the extraction and had disappeared by the end of two weeks. The inflammatory infiltration, which was so striking a feature of the surgical wounds in the earlier experiments, penetrated only a short distance apically

to the level of the cut bone surface. It follows, therefore, that any benefit which may accrue from the reduction of the height of both alveolar crests is likely to be observed only in the superficial part of the socket. In the present instance when approximately one third of the height of the alveolar crests was removed, the area affected was consequently the cervical third of the socket and included the epithelium and the cut surfaces of the alveolar crests.

The apparent increased ease of coaptation of the gingival margins which was one of the most satisfactory features of these experiments was not evident in the three day and one week old wounds, which showed a large gap in the epithelium. By two weeks, however, the gingival margins were firmly united.

The loss of bone suffered as a result of removal of the tips of the alveolar crests can be considered from varying aspects. Clinical observation shows that alveolar bone continues to resorb for an indefinite period after the teeth are lost but, if the healing processes observed in simple forceps wounds can be regarded as a guide, the amount of bone removed in these experiments is probably equivalent to that lost after many months and even years of natural resorption. There is no evidence in this or the previous experiments that any appreciable amount of bone is laid down on the cut surfaces of the crests other than may result in the general process of bone production during the filling of the socket to a line joining the crests. Rebuilding of the crests as a distinct process does not occur.

On the other hand it may be argued that the removal of the lingual or palatal crest will allow a more rapid establishment of the normal rounded contour of the edentulous ridge and that, in consequence, the total amount of bone resorption will eventually be less than occurs after surgical removal of teeth. It is not possible entirely to refute this argument; however, resorption of the lingual or palatal crests in all the wounds was a relatively minor feature, and although the total degree of resorption appeared rather less in wounds treated by removal of the crests, some degree of resorption of the buccal or labial alveolar plates continued to the end of the experiment.

The reduction in the volume of the socket resulting from the lowering of the height of the crests might reasonably be expected to increase the rate of healing, especially with regard to the organization of the blood clot This reasoning was borne out to some extent, but the rate of organization of the clot in simple forceps wounds was variable and at two weeks the clot was organized in all the experiments. The conversion of the socket contents into bone did not take place more rapidly in the bone forceps wounds.

■ *Conclusions*

It seems probable that a more satisfactory healing of the epithelium and subepithelial connective tissue can be obtained by removing the alveolar crests after forceps extraction. The improvement so gained, however, is not evident before two weeks and is not maintained for more than a further two weeks, after which any of the extraction technics employed will produce an equivalent result.

A relatively stable bone condition appears to be produced somewhat earlier

when the alveolar crests are reduced in height, but this is an advantage likely to be outweighed by the considerable operative loss of bone and the inconvenience of the procedure.

■ *Summary*

Teeth were removed by means of forceps from macacus rhesus monkeys and the alveolar crests were reduced in height before suturing the sockets. The following results were noted:

1. The ready approximation of the flaps resulting from removal of parts of the alveolar crests was not maintained during the first few days after extraction.

2. The epithelium was well united at two weeks.

3. Bone fragments, as in previous experiments, were associated with the presence of numerous inflammatory cells.

4. Bone formation in the socket was practically limited by a line joining the cut crests so that the eventual ridge formation was low and flat.

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■ Science and Humanities

Every thoughtful man who hopes for the creation of a contemporary culture knows that this hinges on one central problem: to find a coherent relation between science and the humanities. In education in particular, this problem faces us in two forms. We have to give the future scientist an abiding sense of the value of literature and the arts; and at the same time we have to give to those whose preoccupation lies within the liberal arts a glimpse of the methods, the depth, and the inspiration of science. These are living problems all the way from the school desk through the university and beyond, into the daily life of all thoughtful men. They are, however, focused most sharply in the universities, where the traditional division between science and the humanities cannot be rooted out of the timetable in one generation.—*J. Bronowski and Bruce Mazlish, The Western Intellectual Tradition, 1960.*

Further studies in the spread of local anesthetics

■ *Allen Fred Goldberg,* D.D.S., U. S. Army, and Max S. Sadove,† M.D., Chicago*

The posterior superior alveolar nerve enters the maxilla through several foramens which are variable in their location. Successful analgesia then depends on the dispersion pattern of the local anesthetic solution. The spread in this area is along the path of least resistance over the supraperiosteal surface of the maxilla. It has been found that 1.5 to 1.8 cc. of anesthetic solution is sufficient to anesthetize the posterior superior alveolar nerve.

In an attempt to understand better the mechanics of conduction anesthesia in the oral region, the investigation of the pattern, or area, of dispersion of the solution injected into the tissues must be considered. The dispersion pattern of the injected solution is of greatest importance in those blocks that involve nerves having highly variable positions and relatively few bony landmarks. With this in mind, the posterior-superior alveolar nerve was selected for this survey.

The study of the spread of local anesthetic agent during the administration of a posterior-superior alveolar nerve block was undertaken on patients selected at random from the Oral Surgery Clinic. Basically the technic employed in this study consisted of roentgenographic examination after injecting a local anesthetic solution which contained a radiopaque contrast medium.

The posterior-superior alveolar nerves enter the maxilla through foramens that are highly variable in position and number, located along its infratemporal surface. This nerve innervates the distobuccal and palatal roots of the first molar, the second and third molars, and the portion of the alveolar process, periosteum and mucosa buccal to these teeth. The purpose of this study was to demonstrate roentgenographically the spread of the solution injected relative to the anatomical landmarks and to correlate this spread to the area of analgesia.

■ *Method*

The injection was begun in the superior buccal sulcus inferior to the zygomatic process of the maxilla. The needle was directed cephalad, dorsad, and mediad at an angle of 45 degrees to the Frankfort horizontal plane along the periosteum of the infratemporal surface of the maxilla. After insertion of the needle to a depth of 2 cm., 1.5 to 1.8 cc. of anesthetic solu-

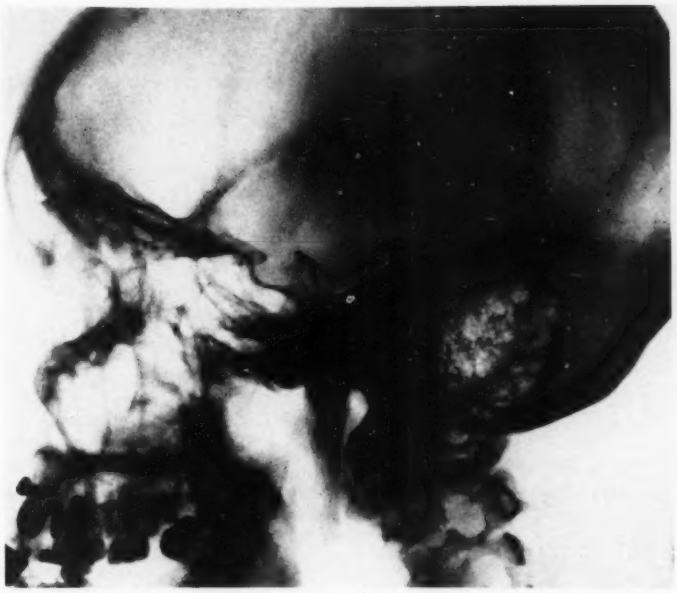

Fig. 1—Lateral projection of the skull showing contrast medium as a 1.5 by 2.5 cm. radiopaque area

tion containing a roentgenographic contrast medium was deposited supraperiosteally.

Analgesia was demonstrated and two roentgenograms were taken approximately four minutes postinjection. These consisted of posterior-anterior and lateral projections of the skull utilizing a roentgenographic-cephalometer to insure uniform, reproducible projection angles and to minimize distortion. The spread of the contrast medium was demonstrated roentgenographically while obtaining satisfactory analgesia with a standard injection technic.

It was seen on examination of the roentgenograms that the pattern of distribution was not an isolated, "pinhead" spread about a readily identifiable landmark but was, however, a diffuse area which easily included the sites of the variable foramens through which the posterior-superior alveolar nerve enters the maxilla (Fig. 1-3). The results of any injection technic in this area, therefore, depend largely on the dispersion of the solution injected. The placement of the needle is of secondary importance to the spread of the solution. The solution spreads along the path of least resistance—in this case the supraperiosteal surface of the maxilla. The left lateral and posteroanterior roentgenographic projections of the skull showed the marked spread of the contrast medium along the infratemporal surface of the maxilla in the tissue planes offering the least resistance (Fig. 1-3).

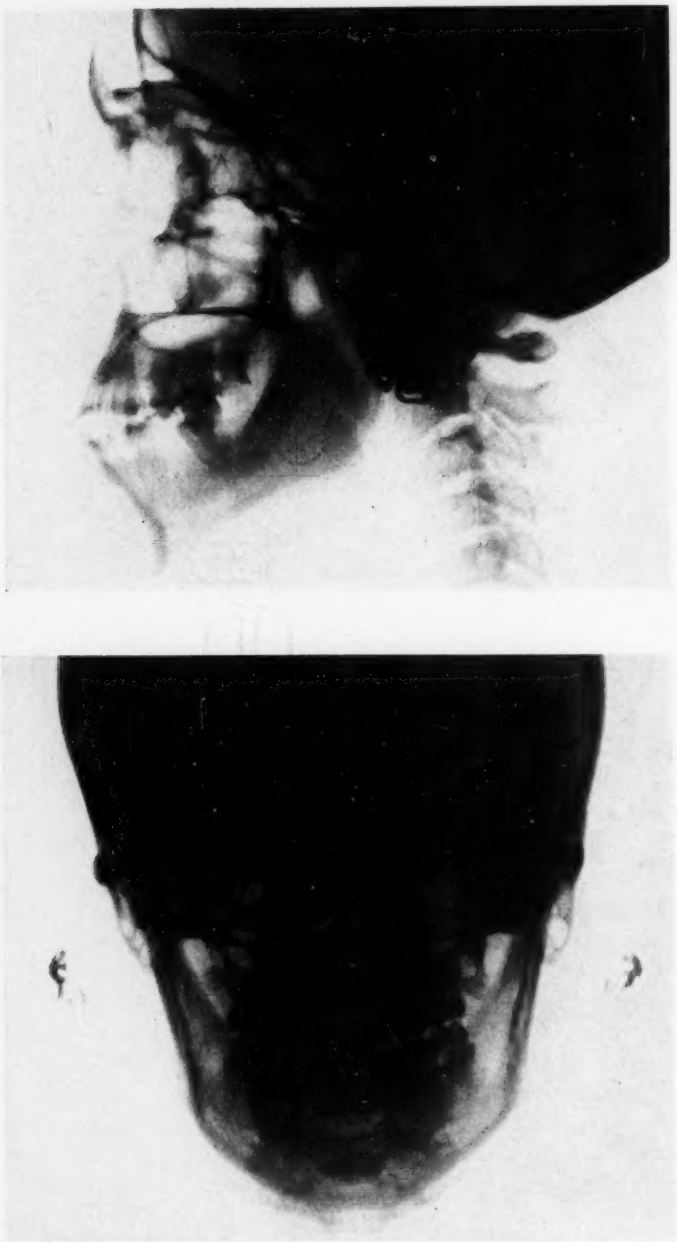

Fig. 2—Left lateral and posteroanterior projections of a "typical" patient showing an area of approximately 2 by 2 cm. covered by the contrast medium

Fig. 3—In this patient a marked lateral distribution of the injected solution is demonstrated

This correlation of spread through the tissue plane overlying the infratemporal surface of the maxilla and successful analgesia of the desired area was demonstrated in the entire series of 13 patients. In two of these patients anesthesia of the lower lip was noted in addition to the expected results. Postinjection roentgenograms of these patients showed an increased spread in a buccal and inferior direction. Two patients in this series experienced a local tissue reaction to the roentgenographic contrast medium. The reaction consisted of pain, erythema and swelling at the injection site for a duration of two days.

The primary determinant of the success of any injection to obtain local anesthesia is the placement of enough anesthetic agent into the proper tissue plane. A sufficient volume of agent must be present to insure a distribution that will include the nerves in question. On the other hand the operator must limit the volume of solution administered so as to limit analgesia to the desired distribution. We have demonstrated that 1.5 to 1.8 cc. of anesthetic solution injected supraperiosteally along the infratemporal surface of the maxilla will suffice to anesthetize the posterior-superior alveolar nerve. As the amount of solution injected is increased, the area of analgesia is increased as determined by the change of the dispersion pattern.

■ *Summary*

Utilizing an anesthetic solution containing a roentgenographic contrast medium, we have shown the spread of this solution roentgenographically after a posterior-superior alveolar nerve block. The solution was demonstrated to spread along the supraperiosteal surface of the maxilla in the plane of least resistance. One and one-half to 1.8 cc. of solution proved to be adequate to obtain the dispersion necessary to anesthetize the posterior-superior alveolar nerves.

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■ The Unexpected

Anyone who does not realize that anything can happen to anybody at anytime does not know what kind of a world we are living in.—*Louis L. Mann. In Quest of the Bluebird, 1957.*

Management of the loose premaxilla in the cleft palate patient

■ *Irvin V. Uhler,* D.D.S., Lancaster, Pa.*

In some patients with cleft palate, lack of rigidity in the premaxillary region is a major obstacle in the construction of a satisfactory speech appliance and prosthesis. This article describes surgical procedures used in the Lancaster Cleft Palate Clinic for treating the loose premaxilla when it is edentulous and when teeth are in a normal position.

Lack of rigidity in the premaxillary region poses many problems in the management of a patient with a cleft palate. Frequently the upper lip is tightly bound to this bulbous process, and the mass itself may contain ill-formed, rudimentary and supernumerary teeth. Then, too, there may be impacted teeth in the line of cleft or clefts. These conditions may be coexistent with a palate impossible to close surgically, making a speech appliance mandatory. Before the prosthodontist can develop a speech appliance, these regions must be free of all tooth elements. The labial sulcus must be deepened, and in extreme instances, the premaxilla must be amputated before rehabilitation can be undertaken. The following is the procedure used in the Lancaster Cleft Palate Clinic.

■ *Treatment*

When consultation between the prosthodontist and orthodontist results in a decision that the premaxilla can be utilized, the patient is referred for oral surgery. Complete mouth roentgenograms and occlusal plane films are used as a guide in determining the location of impacted, unerupted and supernumerary teeth in the premaxilla and the line of cleft or clefts. An incision is made from the depth of the cleft, downward to the crest of the ridge which is carried across the crest and up to the depths of the opposite cleft (Fig. 1). The teeth and tooth elements are dissected out carefully with a chisel held in the pen grasp. The bone is shaved away until all teeth are removed. It is often necessary to make several roentgenograms in the operating room to be sure that all elements have been removed. We have found as many as 17 teeth and tooth elements in a premaxilla. It is imperative, therefore, to have x-ray facilities available in the operating room to assure complete removal of all rudimentary elements. At the same operation any aberrant teeth in the line of the cleft or clefts and any hopelessly diseased teeth are removed. The labial sulcus is deepened by incision to a depth which will make the labial vestibule contiguous with the buccal vestibule. Polyethylene tubing or gauze is sutured into the newly created space, and the tissues are allowed to granulate (Fig. 2). This raw surface undergoes minimal contracture if adequate undermining is

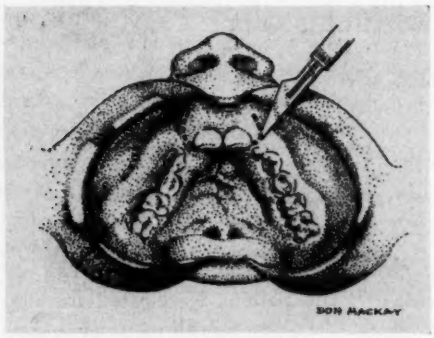

Fig. 1—Incision for preserving labial flap

done. When primary healing is completed, the patient is returned to the orthodontist and the prosthodontist for construction of a speech appliance.

■ *Removal of Loose Premaxilla*

A loose premaxilla frequently is a major obstacle in the construction of a satisfactory speech appliance and prosthesis. Again, the decision to remove the premaxilla rests solely with the orthodontist and the prosthodontist. The loose premaxilla may be edentulous, it may contain normally erupted teeth, unerupted teeth, impacted teeth and rudimentary supernumerary teeth. Malposed teeth may project into the clefts causing tissue trauma and resorption of adjoining alveolar structures. The lip usually adheres to the labial aspect of the premaxilla, leaving little or no vestibule and lending a characteristic flat appearance to the upper lip. It becomes obvious that these patients require a surgical procedure which will remove the premaxilla and all teeth in it (deeply impacted teeth may be found as high as the level of the nasal floor) and at the same time create an adequate labial vestibule (Fig. 3). Before surgery is undertaken, all necessary operative dental procedures are done, and good oral hygiene established. A medical evaluation is made by the staff internist since many times these patients are below par physically because of their handicap. When cleared for surgery, the anesthesiologist manages them under general anesthesia with nasotracheal intubation.

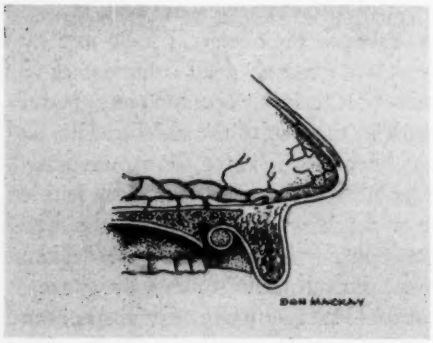

Fig. 2—Cross-section showing distal portion of premaxilla cut down flush with vault of palate, and polyethylene tubing in place

PROCEDURE WHEN TEETH ARE IN A NORMAL POSITION — The interproximal septae are cut on the labial surface (Fig. 1). From the distal surface of the last tooth laterally on each side of the premaxilla, an incision is carried from the crest of the ridge to the bottom of the cleft. The entire labial mucosa is elevated to the superior attachments of the premaxilla (Fig. 4). This tissue is managed carefully as it will be used to line the lip. The palatal tissue is reflected and completely cut away at a level contiguous with what is present of the palatal vault (Fig. 2, 4). This region and the base of the premaxilla will be allowed to granulate. All exposed teeth are removed carefully and the bone

is shaved carefully with hand chisels. If there are impacted teeth, the procedure is carried on until all are removed. This is then verified by roentgenograms made in the operating room.

The remaining portion of the premaxilla is then cut away with rongeur forceps until the base is contiguous with the palatal vault. The labial flap is trimmed of interproximal septae and turned upward to become the lining of the lip. At this point adhesions will be encountered which must be freed by sharp dissection upward to the level of the nasal spine. Occasionally a prominent nasal spine will be found which will require modification with rongeur forceps. When a labial vestibule has thus been created which is equal in depth and contiguous with the buccal vestibule, the flap is sutured in place, becoming the lining of the lip (Fig. 5). We prefer to suture through the lip, tying the sutures externally over pearl buttons (Fig. 5). These are kept in place approximately five days.

PROCEDURE WHEN PREMAXILLA IS EDENTULOUS—When the premaxilla is edentulous, the lip invariably is bound tightly to the premaxilla presenting a flattened and unpleasant appearance. Essentially the incision is the same as when teeth are present, and an effort is made to secure a maximum amount of labial tissue. Many times it will be impossible to secure any, in which case it will be necessary to prepare the labial vestibule by sharp dissection from the bulb of the premaxilla, permitting the region to granulate. Under such circumstances a large raw area will be present

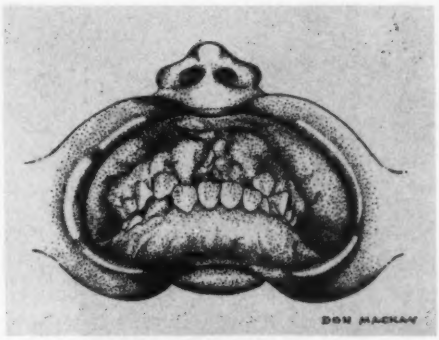

Fig. 3—Healed area showing labial sulcus contiguous with buccal sulci

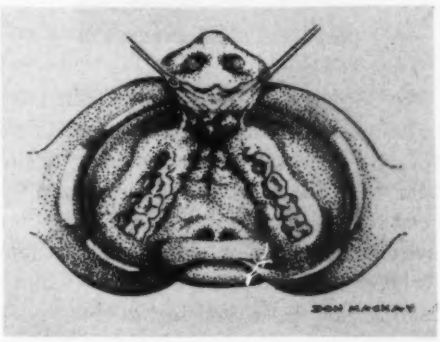

Fig. 4—Labial flap raised prior to positioning as lining of lip

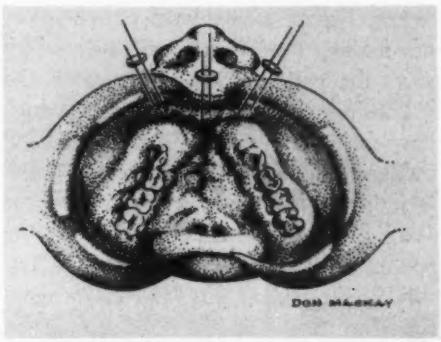

Fig. 5—Labial flap in position with buttons and through and through sutures

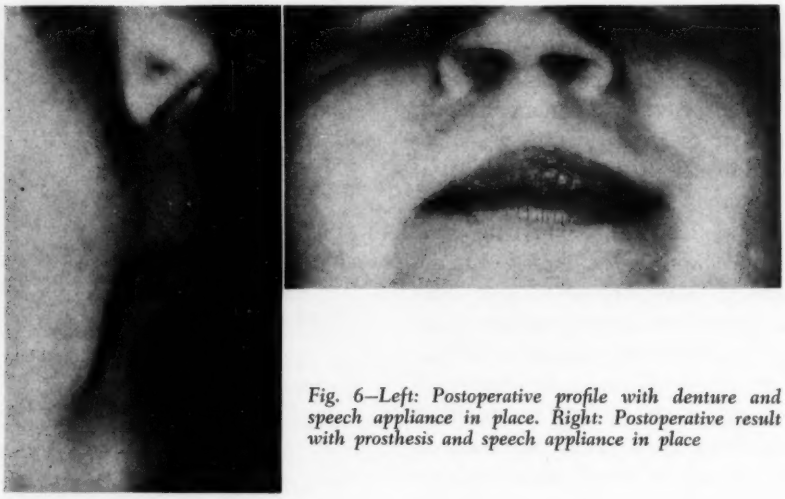

Fig. 6—Left: Postoperative profile with denture and speech appliance in place. Right: Postoperative result with prosthesis and speech appliance in place

after surgery, and the patient will be more comfortable until granulation has taken place if a gauze implant is used. This implant is held by sutures through the lip tied over buttons as described earlier. Our reason for not using grafts in this region is based on our observation of the failures which have been seen in the clinic after previous surgical interventions. Thus far our prosthodontist has not found the granulated surface in any way objectionable, nor basically different from the regions where stents have failed; hence our leaning toward this procedure which saves the patient additional surgery and discomfort. Many of the grafts which have been seen in the Lancaster Cleft Palate Clinic were taken from hair-bearing sites. This tissue was objectionable as a lip lining and necessitated a stripping operation. This, too, helped shape our thinking regarding this facet of lip management.

When primary healing has occurred, usually about the eighth postoperative day, the prosthodontist and orthodontist proceed with the prosthetic and speech appliance. With the area gained by making the labial vestibule contiguous with the buccal vestibule (Fig. 3), a labial flange can be developed which will give a pleasing appearance to an otherwise flat and lifeless upper lip and profile (Fig. 6). When the denture and speech appliance are completed and have been shown by cinefluorographic studies to be constructed properly and adequately, the patient is placed in the hands of the staff speech therapist.—548 *North Duke Street.*

Research program under a grant from Lillia Babbitt Hyde Research Foundation.

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Fibrosarcoma of the mandible

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Fibrosarcoma of the mandible is a rare entity. Because few cases have been reported in medical and dental literature, completely reliable conclusions are not available. The following case is reported in order that its characteristics may be of value in the future.

Fibrosarcoma is a malignant tumor of mesenchymal origin that is composed of fiber-forming cells. It apparently can occur at any age, has no familial significance and occurs equally in both sexes. As with most malignancies, no etiological factor may be condemned. Signs and symptoms are one or a combination of the following: a rapidly or slowly growing, indurated mass associated with the mandible, with pain, pressure, paresthesia and mobility of teeth.

Various types occurring in the mandible have been described. Stuteville[1] speaks of central fibrosarcomas arising from cells of embryonic tissues. He further describes them as being odontogenic if stemming from dental tissues and neurogenic if stemming from perineural tissue. Peripheral fibrosarcomas are described by him as arising from tissues surrounding the mandible, such as the periosteum, connective tissue, fascia, or even the periodontal membrane.

Thoma,[2,3] on the other hand, speaks of three types of fibrosarcoma that occur in the jaw. The intraoral type which develops from the periosteum of the alveolar process or periodontal membrane is said to form multiple masses and is not as malignant as the subcutaneous type. He illustrates a case of the subcutaneous type, very similar to the case reported later in this paper, in which spicules of metaplastic bone extended into the tumor from the jaw as seen in osteogenic sarcoma. The patient was a seven year old girl. The third type is the central fibrosarcoma that develops most frequently in the mandibular canal from connective tissue associated with the neurovascular bundle and causes pain, paresthesia and loose teeth.

Stout[4] and Geschickter[5] have stated their belief that endosteal or central fibrosarcomas do not exist and are actually either osteogenic sarcomas or chondrosarcomas without convincing evidence of differentiation. They expressed the idea that periosteal fibrosarcomas are relatively benign and seldom metastasize, and that parosteal or subcutaneous cases invade bone secondarily and are much more malignant.

These classifications are based mainly on the site of origin of the lesion, and in far advanced or fulminating cases, it is impossible to say whether the lesions were central or peripheral.

Histologically, the cells and fibers are generally arranged in interlaced bands. The cell is spindle shaped with a nucleus shaped similarly and with cytoplasm that is free of vacuoles and granules. Mitotic

Fig. 1—Patient prior to surgery

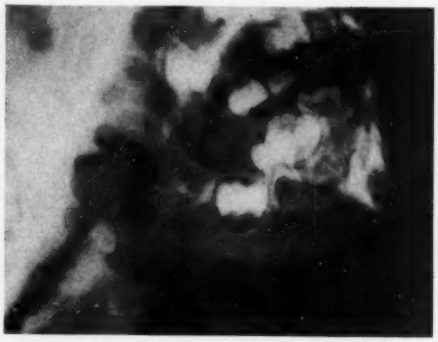

Fig. 2—View of tumor associated with left side of mandible

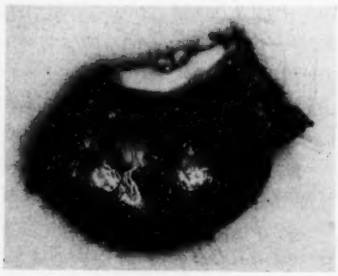

Fig. 3—Lingual view of surgical specimen

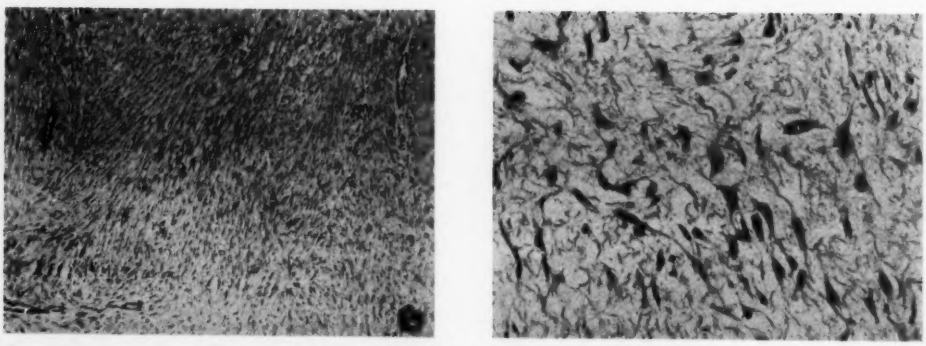

Fig. 4—Left: Low power view of tissue section. Right: High power view

figures vary in number. The terms well-differentiated and poorly differentiated tumors are also applied to the fibrosarcoma. The poorly differentiated tumors are more cellular, have fewer fibers, demonstrate more mitosis and show greater anaplasia and hyperchromatism. Other mesenchymal tissue may be in evidence, such as myxomatous or osseous tissue.

Diagnosis is apparently not always easy, because of the benign nature histologically and the slow growth and lack of metastasis in some of them. Correct diagnosis often is not made until recurrence of the tumor. Hamilton[6] reported a case in which a patient died from recurrent fibrosarcoma of the mandible 16 years after first noting it. Generally, only the anaplastic tumors will metastasize and then usually through the blood stream, the lungs being the first site. Well-differentiated tumors are characterized more by their local infiltrative growth.

Radical local excision is the treatment of choice. Radiation therapy is of little value since these tumors are usually radioresistant.[1,2,6]

According to Stuteville,[1] the incidence of recurrence is very high with over 50 per cent recurring after local excision. The prognosis is influenced by the relative differentiation and cellular activity, the time lapse prior to surgery, the adequacy of the surgical procedure, and, according to some authors,[2,4,5] the location of the neoplasm.

REPORT OF CASE—The patient was a two year old white girl whose parents noted a slight swelling over the body of the left side of the mandible after she had been struck in the jaw by another child two weeks prior to examination. The swelling progressed and increased in size during the two weeks, but no contusion or pain was ever present. The injury probably merely called the parents' attention to the already present mass.

She was a well-developed girl, the youngest of five children who were all living and well. The parents' medical background was noncontributory. Her only serious past illnesses had been measles and whooping cough.

Physical and laboratory examinations were negative with the exception of the tumor associated with the left side of the body of the mandible (Fig. 1). This was a nontender, bone-hard, 5 by 3.5 cm. mass, which was fixed to the mandible. Bimanual palpation revealed the tumor to be fixed to the inferior half of the mandible with equal amount of tumor present on the medial as on the lateral surface of the jaw. A small, well-defined, easily movable, nontender lymph node was palpated below the mass.

Roentgenograms of the mandible revealed the right side to be normal. Figure 2 demonstrates a good-sized soft tissue mass intimately associated with the left side of the body of the mandible. The inferior margin of the mandible is irregular, and a few small spicules project from the inferior border into the tumor.

Surgery was performed approximately three weeks after the tumor was discovered by the parents. The patient was under oro-endotracheal general anesthesia. An incision was made one finger breadth below the inferior border of the mandible and extended from near the midline to the angle. The incision was

carried through skin, subcutaneous tissue, fascia, and the platysma muscle to expose the mass and the left side of the body and half of the ramus of the mandible.

The tumor appeared to be well-encapsulated and firmly adherent to the mandible. A good-sized, representative part of the tumor was submitted for a frozen section. The report was that of fibrosarcoma.

The tumor and mandible were then freed of all surrounding tissue, and, by means of a Gigli saw, the mandible and the attached mass were resected just inferior to the sigmoid notch and just medial to the deciduous cuspid. Figure 3 illustrates the specimen. The previously palpated submaxillary lymph node was excised and submitted for examination.

Hemostasis was obtained, and the mucous membrane of the cheek and floor of the mouth were approximated and sutured with no. 00 chromic catgut. The wound was closed in layers with no. 00 plain catgut and the skin was closed with multiple interrupted no. 0000 silk sutures after a rubber drain was placed. A pressure dressing then was applied.

Postoperatively a cutdown was done, and 1,000 cc. of 5 per cent glucose in normal saline solution and 250 cc. of whole blood were administered. Nutrition and hydration were achieved for almost a week through a nasal-gastric tube until the patient would take fluids orally. Procaine penicillin 300,000 units intramuscularly was given daily during that period.

The drain was removed after 48 hours and the sutures after one week. The wound healed uneventfully.

Examination of the specimen by the pathology department revealed a tumor composed of interlacing bundles of spindle-shaped cells (Fig. 4). In some areas, the cells had a myxomatous appearance. In other areas, definite colonization was observed. The nuclei varied only slightly in size, but were moderately hyperchromatic. Mitotic activity was not common. As is true in most sarcomas, the lymph node showed no evidence of the neoplasm.

A chest roentgenogram and clinical examination 15 months postoperatively revealed no evidence of metastasis or recurrence, and reconstruction of the mandible utilizing a bone graft from the ileum is planned for the near future.

DISCUSSION AND SUMMARY — This case closely resembles a case reported by Thoma. Both patients were girls in the first decade of life with the tumor forming either from the periosteum of the mandible or from the parosteal tissues. Roentgenographic findings were almost identical, revealing small spicules of bone extending from the lower border of the jaw into the tumor.

The fibrosarcoma in this case is considered an early, well-differentiated peripheral tumor, which was widely resected and offers a good prognosis.

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†Assistant professor in oral surgery, Marquette University School of Dentistry.

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CASE REPORTS

Hemangio-ameloblastoma: *report of case*

■ *Richard T. Oliver, D.D.S., M.S.; W. F. McKenna, D.D.S., Lafayette, Ind., and William G. Shafer,* D.D.S., M.S., Indianapolis*

Mixed odontogenic neoplasms constitute a unique group of lesions characterized by the simultaneous proliferation of more than one type of primary odontogenic tissue with all elements actively participating in the neoplastic process. True mixed tumors occur in many parts of the body, certain ones being more common than others (for example, teratomas of different types and carcinosarcoma including embryonal carcinosarcoma of the kidney) but in general are rare conditions.

The fact that the odontogenic epithelium and connective tissue participate equally in the formation of the odontogenic apparatus would suggest that mixed tumors would be quite likely to occur here, but such does not appear to be the case. Although many mixed odontogenic tumors have been reported, their number is not significantly greater than other types of true mixed tumors.

The most common type of mixed odontogenic tumor is the odontoma, named more specifically by some authorities as the hard or calcified mixed odontogenic tumor. There is considerable doubt that this should be classified as an actual neoplasm, many workers preferring to think of it as simply an aberration in the process of normal odontogenesis.

Less common lesions have been reported on occasion, composed of at least two basically different types of tissue, at least one of which is certainly of odontogenic origin. These include the ameloblastic fibroma, ameloblastic neurinoma, ameloblastic odontoma and ameloblastic hemangioma. Although the epithelial components of these tumors are easily recognizable as being derived from the odontogenic apparatus, the mesenchymal components do not share this ease of recognition. Although it is entirely possible that these latter components are of odontogenic origin, it is equally possible that they originate from adjacent tissues in proximity to the dental apparatus and simply represent "collision" tumors. Arguments supporting both views have been offered by different investigators, and the well-known inductive effect of one type of tissue on other types in the process of normal odontogenesis is always emphasized.

Too few cases of the true mixed odontogenic tumors, including very few examples of the hemangio-ameloblastoma, have been reported to date to allow resolution of this problem here.[1-4] In the hope of clarifying this situation, the continued reporting of such cases is to be encouraged, and it is for this reason that the present case of a hemangio-ameloblastoma is described in detail.

REPORT OF CASE—This tumor occurred in a young woman in otherwise good health. The roentgenographic appearance of the lesion and its location in the mandible gave the impression of a dentigerous cyst. Definitive diagnosis was possible only after the microscopic examination.

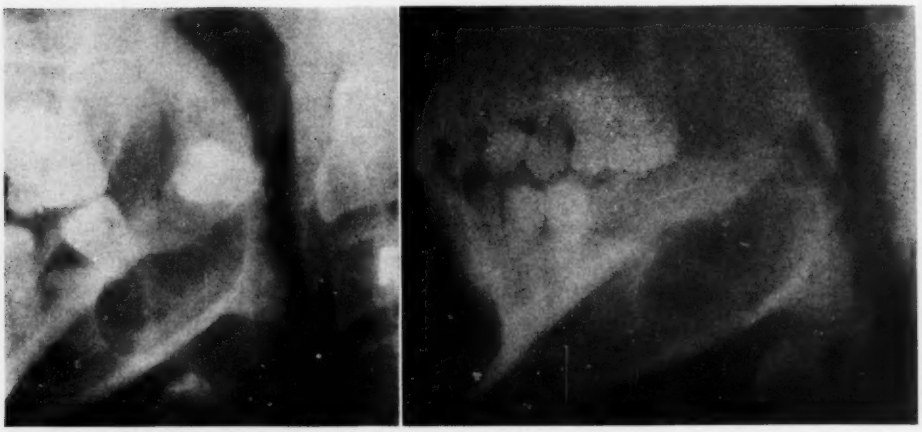

Fig. 1—Left: Preoperative view shows radiolucent area. Right: Postoperative view shows defect in mandible

HISTORY—A white woman, 33 years of age, was seen on April 15, 1958. She was referred to this office by her dentist, whom she had consulted because of mandibular swelling and a bad taste in her mouth accompanied by intermittent pain for the past year. The intraoral roentgenogram which she brought to this office disclosed a large radiolucent area at the angle of the right side of the mandible. Other past history was noncontributory.

INTRAORAL EXAMINATION—Examination of the oral cavity revealed missing lower right first and third molars, a slight enlargement of the mandible posterior to the second molar and some crepitation on palpation over the enlarged region. The patient did not complain of pain at this time. There was a fistulous opening in the mucous membrane just distal to the second molar, although there was no apparent discharge.

ROENTGENOGRAPHIC EXAMINATION—Lateral jaw views of the right side of the mandible disclosed a large radiolucent area measuring 4 cm. by 2.5 cm. extending from just anterior to the second molar up into the ascending ramus with an unerupted third molar displaced to the upper limits of the area. The first molar was missing and the root tips of the second molar were partially resorbed. The lower border of the mandible was intact and measured 3 mm. in thickness (Fig. 1, left).

A tentative diagnosis of dentigerous cyst associated with an unerupted third molar was made and the patient was prepared for surgery.

OPERATION—With the patient under a right mandibular block and infiltration anesthesia, an incision was made through the mucoperiosteum on the crest of the alveolar ridge extending from the first molar region to a point halfway up the anterior border of the vertical ramus. A buccal flap was prepared, and the second molar was removed by forceps extraction. All overlying buccal bone was removed from the limits of the lesion. This procedure exposed a tough fibrous lining which was easily separated from the surrounding bone. The sac was attached to the soft tissue only in the area of the fistulous tract; this was dissected free along with a wide margin of tissue around the tract. The third molar was sectioned and removed.

Examination of the bony walls of the resulting cavity in the mandible showed no evidence of lining remaining and no sign of infiltration into any of the surrounding tissues. The mandibular nerve and vessels were fully visible in their course across the lingual aspect of the cavity.

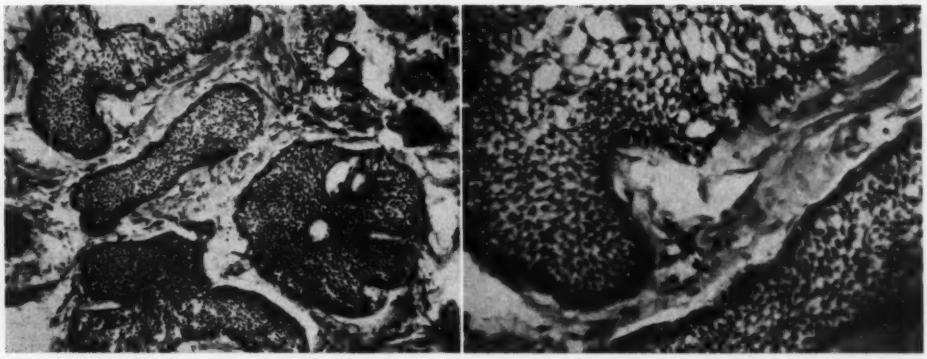

Fig. 2—Left: Low power view of tissue section shows typical ameloblastoma. Right: High power view

The flap was positioned and closed with multiple silk sutures, and an iodoform gauze dressing was placed lightly into the bony defect, the end of it protruding through the anterior portion of the incision.

A postoperative lateral jaw roentgenogram showed the resultant defect in the mandible (Fig. 1, right).

The patient was given 600,000 units of fortified procaine penicillin intramuscularly and dismissed with instructions for postoperative care.

MICROSCOPIC EXAMINATION—Histologic examination revealed a piece of tissue composed entirely of a neoplastic mass comprised of epithelial cells showing a variety of patterns and a great many vascular channels. Around the border of the specimen there were nests of epithelium made up of peripheral columnar-shaped cells resembling ameloblasts surrounding collections of cells resembling stellate reticulum. These nests of neoplastic cells were typical of the simple ameloblastoma (Fig. 2). Most of the tumor mass, however, was made up of sheets of cells which bore greatest resemblance to squamous epithelium (Fig. 3, left). Scattered throughout this epithelium were found great numbers of dilated vascular channels of varying size, lined by endothelial cells and filled with blood (Fig. 3, right). The neoplastic epithelial cells exhibited very little pleomorphism and did not vary in size, shape or staining reaction. Mitotic activity was not prominent. Around this

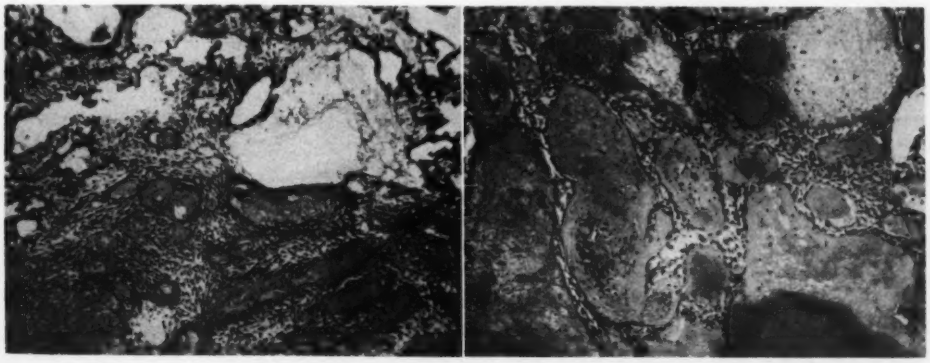

Fig. 3—Left: Low power view of tumor section. Right: High power view. Note many dilated vascular channels

central tumor mass there appeared to be a connective tissue wall forming a lumen which contained this large proliferating mass of epithelium and blood vessels. The connective tissue wall was lined by a very thin layer of squamous epithelium. The vascular portion of the mass had assumed such a prominent feature that it must be considered as an integral part of the neoplasm.

COURSE—The postoperative period was uneventful. The original gauze dressing was replaced on the fifth postoperative day. An impression was made of the right side of the mandible and an acrylic appliance constructed to act as a plug to keep the lower anterior portion of the wound open into the bony defect. This appliance was inserted May 1, and no other dressing was used after that time. Use of the appliance was discontinued June 30.

The patient has been comfortable since the operation. A roentgenogram taken December 6, 1958, showed good progress toward bone regeneration in the area and no evidence of recurrence of the lesion (Fig. 4). The patient was last seen on April 16, 1960, two years after the removal of the lesion. Roentgenographic and visual examination of the region showed no evidence of recurrence.

COMMENT—A case is reported in which an extremely rare variant of the ameloblastoma, a hemangio-ameloblastoma, was found in a young woman. After surgical removal, the patient was advised of the potential seriousness of her lesion and instructed to return periodically for roentgenographic and visual examination.

Fig. 4—View eight months after surgical procedure

Although recurrence is a possibility with this lesion, it was not considered that there was sufficient indication for radical jaw resection at this time.—2323 *South Street.*

*Department of oral pathology, Indiana Univeristy School of Dentistry.

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■ Freedom Requires Effort

Free men must be quick to understand the kinds of effort that are required to keep their society vital and strong. If they have the wisdom to demand much of themselves, their society will flourish. But a free society that refuses to exert itself will not last long. And freedom alone won't save it. *Life Magazine. The National Purpose. John W. Gardner. Chicago Daily News June 25, 1959.*

Dentigerous cyst of mandible:
report of case

■ *William B. Linenberg,* D.D.S., M.S.D.; L. Edgar Frush,† D.D.S., and H. James Harpole,‡ D.D.S., Atlanta, Ga.*

The dentigerous cyst is one of the pathologic growths originating from the epithelium of the enamel organ[1] and involves impacted or unerupted teeth in either the maxilla and mandible.

It is generally agreed that this lesion occurs in youth. Scudder[2] reports that the dentigerous cyst rarely appears during the first dentition. He found them most frequently during adolescence and early adult life; that is, during or after the eruption of the second dentition.

Waldron[3] states that these cysts are most likely to develop during the eruption of the permanent dentition and may be discovered in children about ten years old. Most of them, however, are seen during the second decade.

A review of the literature reveals very few dentigerous cysts reported in the first decade of life.[2-4] For this reason, the following case report is presented of a six year old Negro girl with a dentigerous cyst in the left body of the mandible which involved a developing bicuspid.

REPORT OF CASE—On August 3, 1959 a well developed and well nourished six year old Negro girl was referred from the pediatric service to the oral surgery service of the Grady Memorial Hospital for diagnosis and treatment. The mother had brought the child in for pediatric consultation with the complaint that there was a swelling of the tissues of the left side of the face. Two weeks previously, the mother had become aware of a nodular swelling overlying the body of the mandible on the left side. It had slowly increased in size; however, the child evidenced no pain and a history of trauma was denied.

EXAMINATION — Visual examination revealed a swelling of the face and neck that involved the body on the left side of the mandible and extended into the superior portion of the cervical region. On palpation, the mass appeared to be firm, nontender, nonfluctuant and definitely attached to the mandible. Intraoral examination revealed the oral mucosa on the affected side to be of normal tone and texture. A parchment-like feeling to this region was noted on palpation. Pain was not elicited. There was no elevation of temperature and the remainder of the clinical examination was negative.

Roentgenographic examination (Fig. 1) revealed a developing bicuspid at the lower border of the mandible in the mental region. A radiolucent area was noted surrounding the coronal aspect of the unerupted tooth and extending from the inferior border of the mandible superiorly to the overlying mucosa and from the unerupted first permanent molar to the erupted first deciduous molar.

A diagnosis of dentigerous cyst of the left body of the mandible was made and the patient was admitted to the hospital.

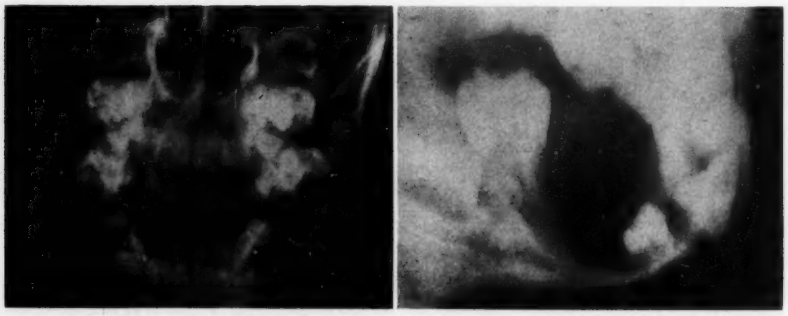

Fig. 1—Preoperative views of dentigerous cyst

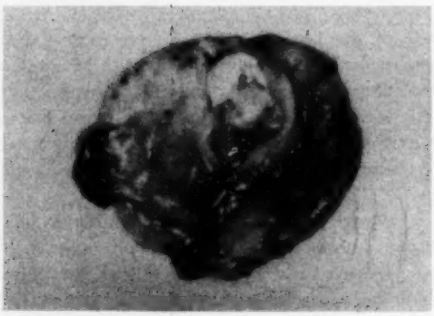

Fig. 2—Dentigerous cyst

The systemic examination was noncontributory. Chest roentgenograms were negative. Blood studies on admission revealed a white blood cell count of 5,100. The hematocrit was 32 mm. and the hemoglobin was 11.4 Gm. The urinalysis was essentially negative and the urine had a specific gravity of 1.015. The results of the serologic test were negative.

TREATMENT—With the patient under nitrous oxide-oxygen-ether anesthesia, an oral endotracheal intubation was performed. The oral cavity was disinfected with nitromersol tincture (Tincture of Metaphen) and then the region surrounding the mouth was draped with sterile towels. Two throat packs were introduced into the oral pharynx and a mouth prop was placed between the maxillary and mandibular teeth on the right side. A syringe of local anesthesia containing 1:50,000 parts epinephrine was injected into the mucosa at the site of incision for hemostasis.

An incision was made on the crest of the alveolar ridge starting from the posterior portion of the cyst and bringing the scalpel forward to the anterior part of the growth. The incision was curved in order to expose the involved region.

The mucoperiosteum was then dissected from the bony wall which was very thin on the buccal surface. In doing this, the cyst sac ruptured and a straw-colored, viscid, stringy fluid was suctioned. The cyst membrane was dissected out using the periosteal elevator and curets. The unerupted developing tooth was removed with the sac (Fig. 2).

The bony edges were carefully saucerized with a bone file and the soft tissue was approximated, trimmed and closed with no. 000 black silk suture.

POSTOPERATIVE COURSE — Postoperative roentgenograms revealed that the cyst was entirely enucleated and there was no evidence of a mandibular fracture. Except for mild postsurgical edema and moderate pain which was easily controlled by acetylsalicylic acid, the postoperative course was uneventful. At the end of one week the sutures were removed. At the end of six weeks, a fine pink linear scar could be seen on the alveolar ridge (Fig. 3, left). The roentgenogram showed bony activity taking place (Fig. 3, right).

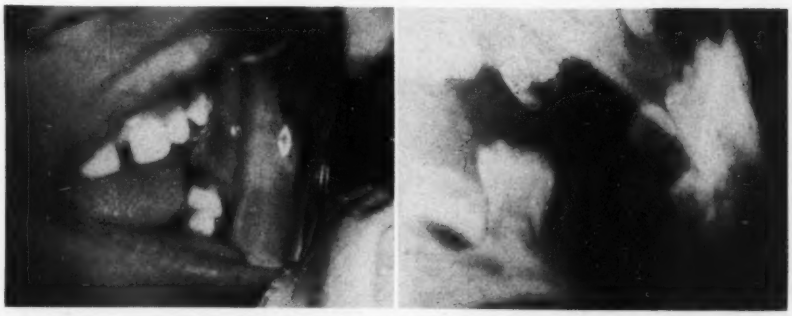

Fig. 3—Views taken six weeks after operation

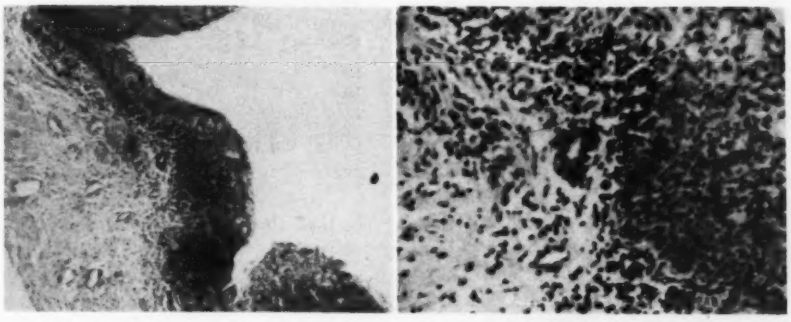

Fig. 4—Left: Low-power photomicrograph of specimen. Right: High-power view

PATHOLOGIC FINDINGS — Macroscopically, the specimen was a round cystic mass of reddish-brown tissue measuring 2.5 by 2.0 by 0.6 cm. On opening the cyst, there was a slightly nodular grayish lining with small areas of punctate hemorrhage. A developing bicuspid measuring 0.6 by 0.4 cm. projected from the lining of the cyst.

Microscopic examination of the section revealed a fairly thick fibrous connective tissue cyst wall with an intact squamous epithelial lining. The epithelial lining varied in thickness from two or three cells to a thick, well developed layer with formation of rete ridges. The underlying connective tissue showed a diffuse infiltration of plasma cells, lymphocytes and polymorphonuclear leukocytes. Dilated capillaries were conspicuous (Fig. 4).

SUMMARY—A case report of a dentigerous cyst involving a developing bicuspid in the left body of the mandible of a six year old girl is presented because there have been few cases reported in the literature involving a child in the first decade of life.

*Resident, department of oral surgery, Grady Memorial Hospital.

†Assistant resident, department of oral surgery, Grady Memorial Hospital.

‡Chief, department of oral surgery, Grady Memorial Hospital.

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Adenoameloblastoma: *report of case*

■ *Richard W. Tiecke,* D.D.S., Chicago, and Robert B. Shira,† D.D.S., Washington, D. C.*

The adenoameloblastoma, a relatively rare histologic variant of the ameloblastoma, has been reported infrequently and then not always under that name. Stafne[1] reported three in 1948 and called them "epithelial tumors." Schultz[2] reported one as a "recurrent ameloblastoma" and Oehlers[3] reported one as "an unusual pleomorphic adenomalike tumor in the wall of a dentigerous cyst." Others[4-7] have also been reported under various titles and terms. A thorough review of the literature has revealed 20 cases, to which is added one of our own. One more has come to our attention recently. The only information available is that the tumor occurred in the anterior part of the mandible of a 17 year old Japanese girl. Three other instances of this tumor are mentioned, but no pertinent data are given.[8]

The adenoameloblastoma, although its sources of origin are questioned, is included in the classification of odontogenic tumors unofficially approved by the American Academy of Oral Pathology as an "epithelial odontogenic tumor." It is separated histologically from other ameloblastomas in that ductlike spaces are formed by its epithelial component.

The first reference to an ameloblastoma of any type was by Broca[9] in 1868. Falkson[10] discussed ameloblastomas in 1879 and Malassez[11]suggested the term "adamantine epithelioma" some time later. Since then, many other investigators[12-16] have reported series of cases, the largest of which was reported by Robinson.[15] He reported 379 cases and stated that slightly over half the tumors were found in females; that in 222 patients the average age at discovery of the tumor was 30.1 years, and that about 83.7 per cent were seen in the mandible.

Cahn[13] and others have described ameloblastomas occurring in the walls of follicular cysts.

The ameloblastomas are regarded as benign tumors and should be treated as such but with the reservation that they have a strong tendency to recur. This tendency is well illustrated in Robinson's[15] report: of the 379 patients, 119 had from 1 to 22 recurrences.

The adenoameloblastoma, a separate histologic entity, has a somewhat different clinical course than does the simple ameloblastoma.

One of the noteworthy clinical differences is that the adenoameloblastoma occurs in a very young age group. One patient in this group of 21 was under 10 years of age, 14 were in their teens, 3 in their twenties, 1 in his thirties and 2 in their forties. The age recorded was the age at the time of professional treatment. The onset may conceivably have been, and probably was, several years earlier, as most patients gave a history of the tumor's having been present several years. One patient 40 years of age (Schultz' case)[2] was seen because of a recurrence. The initial lesion, however, according to the clinical history, had appeared some ten years earlier.

Another important factor is that although 20 of these patients were treated by conservative surgery, 14 did not have a recurrence. Six were lost during the follow-up period and 1 (Schultz' case)[2] had 4 recurrences. Follow-up ranged from 5 months to 14 years.

In contrast to the 83.7 per cent of ameloblastomas that occurred in the mandible in Robinson's series, 8 of the adenoameloblastomas in this series were in the mandible and 13 in the maxilla. Of the 8 that occurred in the mandible, 5 were in the cuspid region, 1 in

Fig. 1—Note large radiolucent area and suggestion of calcified material near center of mass. Some slight root resorption is evident

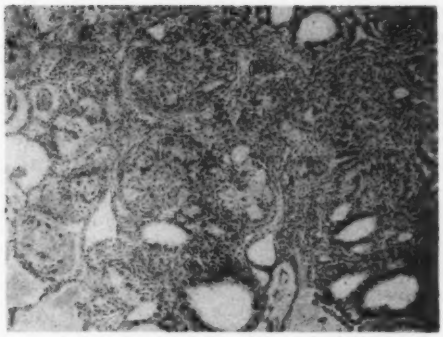

Fig. 2—Tumor is composed chiefly of odontogenic epithelium which, in some areas, takes form of ductlike structures

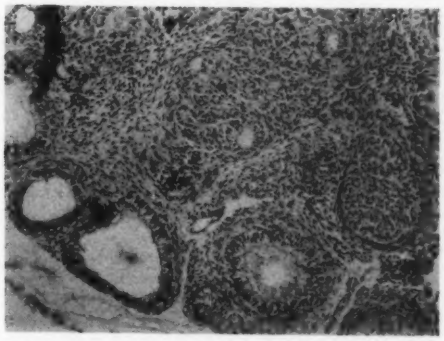

Fig. 3—Note columnar cells lining ductlike spaces

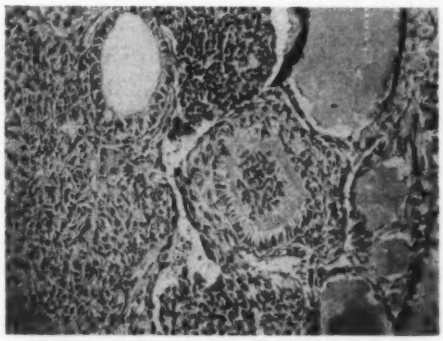

Fig. 4—Calcified material is seen on right side of photograph and within tumor mass

the "anterior" region, and 2 in the third molar region. Of the 13 occurring in the mandible, 9 involved the cuspid region, 2 were in the palate, 1 in the maxillary sinus and 1 between the central and lateral incisors. Ten of the 21 were associated with unerupted teeth, 8 were associated with follicular cysts and 2 were associated with cysts, type undetermined. Fourteen occurred in females and 7 in males. Nine occurred in members of the white race, 3 in Negroes and 2 in Orientals; in 7 the race was not given.

REPORT OF CASE—The patient, a 34 year old Negro woman, was admitted to the Northwestern University Dental School Oral Surgery Clinic on March 19, 1958. Her chief complaint was of swelling and pain on pressure in the right maxillary region. The symptoms had been present for approximately seven months.

Her previous medical and dental histories were negative. Extraoral physical examination revealed no abnormalities. Intraoral examination revealed a large swollen mass in the right maxillary bicuspid region. The vestibule and buccal mucosa in the region also were swollen. Intraoral roentgenograms of the bicuspid region revealed a round radiolucent area in the cuspid-bicuspid region (Fig. 1). Root resorption was noted on the cuspid and first bicuspid.

On the same day the patient was locally anesthetized by means of a maxillary second division block and infiltration using procaine hydrochloride, tetracaine and nordefrin. A soft tissue flap was reflected, and the tumor was removed. The cuspid and first bicuspid also were removed. The wound was closed by suture.

The firm tumor was gray and measured approximately 2 cm. by 2 cm.

The sutures were removed March 24. The patient was seen again on April 2 and August 7, at which time the site of surgery was healed completely. Roentgenograms of the region revealed a diminution in size of the radiolucent area.

Microscopic examination of the tumor showed that it consisted of a dense, highly cellular mass of odontogenic epithelium which formed numerous ductlike spaces of varying size (Fig. 2). The latter were lined by cuboidal or columnar epithelium (Fig. 3). Calcified material also was noted (Fig. 4). The fibrous connective tissue stroma was scanty. The tumor was rather well circumscribed in part by a wide band of loose, fibrous connective tissue which contained a light sprinkling of lymphocytes.

SUMMARY—A case of adenoameloblastoma is reported, and 20 other cases are reviewed. Of the 21 cases, over half were associated with either unerupted teeth or follicular cysts. In 14 instances the tumor was located in the cuspid region.

The majority of the adenoameloblastomas occurred in the maxilla, although the majority of ameloblastomas in general occur in the mandible.

Most of the adenoameloblastomas are found in a younger age group than the simple ameloblastoma.

*Professor of pathology, Northwestern University Dental School.

†Colonel, U. S. Army. Chief, oral surgery section, Walter Reed Army Hospital.

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Postextraction acute cellulitis caused by *Salmonella choleraesuis*: *report of case*

■ *Peter A. Rubelman, D.D.S., West Hollywood, Fla.; John F. Reback, Sc.D., and C. E. Loveman, D.D.S., Baltimore*

Swelling of the face, jaws or neck is not an uncommon observation in dental practice. Whenever bacteriologic investigation has been made, staphylococci and streptococci appear to be the most usual etiologic agents.[1] *Salmonella* are primarily intestinal inhabitants. It may be noted that isolation of the organism from tonsils has been reported[2,3] and the possibility of entry by way of pharyngeal lymphatics has been proposed.[2] However, cellulitis due to *Salmonella* species has not, to the authors' knowledge, been reported previously.

CASE REPORT—A 31 year old Negro woman was first seen in the dental clinic at Sinai Hospital on August 13, 1958. When she presented herself, she had a large swelling on the right side of her face, the floor of the mouth and the upper part of her neck. She had had an extraction of the lower right second molar 14 days before. The patient claimed there was no swelling at the time of the extraction, but the swelling had increased in size progressively since the extraction. There was no history of enteric fever or gastroenteritis.

Physical examination on admission revealed her temperature to be 99.1°F. There was an indurated, tender, nonfluctuant, swelling of the right side of the face and floor of the mouth. Because of trismus of the masticating muscles, only lateral jaw roentgenograms were taken. They revealed no pathologic condition in the remaining teeth or bone. The postextraction socket in the lower right second molar area also appeared normal.

LABORATORY DATA—Two consecutive cultures taken nine days apart grew out *Salmonella choleraesuis* var. Kunzendorf. Identification was made by agglutination and biochemical tests. The identification of this organism was confirmed by Dr. E. Swecker of the Maryland State Bureau of Laboratories.

TREATMENT AND COURSE — Penicillin therapy was started on admission but did not abort the infection. The region became fluctuant and on August 18, with sterile procedure, a horizontal incision was made into the most dependent portion of the abscess near the angle of the mandible. Considerable pus was evacuated from the region and a culture was obtained. A rubber tube drain was inserted. On the following day her temperature was 100°F. There was little exudate noted and the drain was changed. The 48 hour culture report isolated a coliform bacillus, though it was not specifically identified. It was sensitive to a sulfa combination of sulfacetimide, sulfadiazine and sulfamerazine. Triple sulfa therapy was started and penicillin was discontinued. On August 22, the organism was identified as

Salmonella choleraesuis. This identification was verified by Dr. E. Swicker of the Maryland State Bureau of Laboratories. On August 27 there was still moderate swelling and continued drainage and because of the unusual bacteriologic finding, a second culture was made. The isolated organism was again identified as *Salmonella choleraesuis.* Confirmation was obtained again from the Maryland State Bureau of Laboratories. The organism appeared to be but weakly sensitive to the triple sulfa treatment, but definitely sensitive only to chloramphenicol and streptomycin. Chloramphenicol therapy, by mouth, was started on September 4, and the rubber drain was removed. By September 12 the patient's temperature was 99.1°F., and the swelling had gone down considerably. On September 19 the swelling had almost completely subsided and on October 17 the patient was discharged from the dental clinic symptomless.

Serum taken from this patient February 9, 1959, six months after the first isolation of the *Salmonella,* showed agglutination titers of 1:320 to the somatic antigens of *S. choleraesuis* (VI, VII) and of 1:64 to the flagellar antigens (C, 1, 5). Cultures of the tonsils at this time grew out a few beta streptococci, numerous alpha streptococci and moderate numbers of *Micrococcus,* but no *Salmonella* or coliforms.

CONCLUSIONS—The possibility that *Salmonella* species might be numbered among the etiologic factors involved in acute cellulitis appears hitherto to have been unsuspected. This possibility should be considered when an acute cellulitis persists in the face of adequate therapy. Bacterial culture to determine the presence of antibiotic-resistant strains and species out of their normal habitat, would seem to be indicated in modern dental practice.—*6244 Hallandale Beach Boulevard.*

From the departments of dentistry and pathology (microbiology division), Sinai Hospital, Baltimore.

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■ WANTED DEDICATED MEN

The establishment of a durable peace, the strengthening of a free society, the enrichment of the traditions on which freedom depends—these cannot be achieved by aimless or listless men. All our wisdom, all our talent and vitality, all our steadfastness will be needed if we wish to attain these goals. Can we count on an ample supply of dedicated Americans?

The answer must be conditional. If—as a nation—we understand, expect and honor dedication, the supply will be ample. But if we assume that dedicated men are exceedingly rare and probably a little foolish, the supply will be low.

It is unfortunately true that Americans have to some degree lost the habit of asking for or expecting devoted action. Long continued, such failure to expect dedication can have only one outcome: We shall eventually lose the capacity for it. *Life Magazine. The National Purpose. John W. Gardner. Chicago Daily News June 25, 1959.*

Congenital cleft mandible: *report of case*

■ *Alexander G. Russell, III, D.D.S., and*
Clement E. Staley, D.D.S., M.S., Newport News, Va.

This instance of congenital cleft mandible is reported because of the extreme rarity of its occurrence. A search of the literature indicated that only four previous cases have been reported.

HISTORY—A 15 year old Negro boy was referred on Oct. 17, 1959 for examination and evaluation of a cleft mandible. His complaint was difficulty in masticating because of individual movement of the two sides of the mandible. He also had a speech problem because of ankyloglossia. He has been followed periodically since birth by various physicians. At six weeks of age he had had a surgical closure of his chin and lower lip. Since that time, no surgery had been undertaken.

CLINICAL EXAMINATION—Clinical examination revealed a cleft of the mandible at midline with independent movement of both sides of the mandible. Fibrous tissue was holding the two halves of the mandible approximately three quarters of an inch apart. The patient also had ankyloglossia because of the excess tissue in the floor of the mouth which extended into the region of the cleft. No mandibular anterior teeth were missing and no actual bone loss was noted. He was able to assume almost any occlusal relation because of the independent movements of the two sections of the mandible.

ROENTGENOGRAPHIC EXAMINATION—Periapical and occlusal views were taken which gave a clear view of the cleft and showed cortical bone extending around both anterior edges of the mandible (Fig. 1, left and center). Intraoral and extraoral photographs also were taken (Fig. 1 right).

TREATMENT AND COURSE—The patient was admitted to Riverside Hospital, Nov. 1, 1959 at which time a complete physical exami-

Fig. 1—Left: Intraoral view showing cleft with fibrous tissue and ankyloglossia. Center: Preoperative periapical film of cleft site taken Oct. 17, 1959. Right: Extraoral view showing scars from lip and chin closure

Fig. 2—Postoperative view of operative site taken Dec. 28

nation was made. On Nov. 3 he was operated on under general anesthesia (thiopental sodium, nitrous oxide and oxygen). He was prepared and draped in routine manner. An incision was made under the inferior border of the mandible in the chin region from approximately one cuspid to the other. The underlying tissue was bluntly dissected down to the cleft site in the bone. The soft tissue was reflected back and the fibrous tissue in the cleft site carefully freed and removed. Rongeur forceps was used to remove the edges of cortical bone from the anterior borders of each section of the mandible. The medullary portion of the mandibular halves was exposed from the inferior border up to the alveolar process. With surgical burs, two holes were drilled into each half of the mandible about a quarter inch back from the site of the cleft. Next .020 gauge stainless steel wire was placed through the holes, thus having two parallel wires across the cleft region. The sections were then brought into close apposition and the wires tightened securely. The region was debrided carefully and closure made. Plain gut sutures were placed deep, tissue closure was accomplished with no. 0000 black silk, and a petroleum jelly gauze dressing was placed over the area of the incision.

Next the oral cavity was entered. The remaining fibrous tissue was dissected away from between the mandibular central incisors. The region of ankyloglossia was incised and repositioned and closure in the floor of the mouth was completed with no. 000 black silk. A .020 gauge stainless steel wire was then placed around the mandibular incisors and drawn up securely in an effort to secure added stabilization during the initial healing period. The patient withstood the procedure well and left the operating room in good condition.

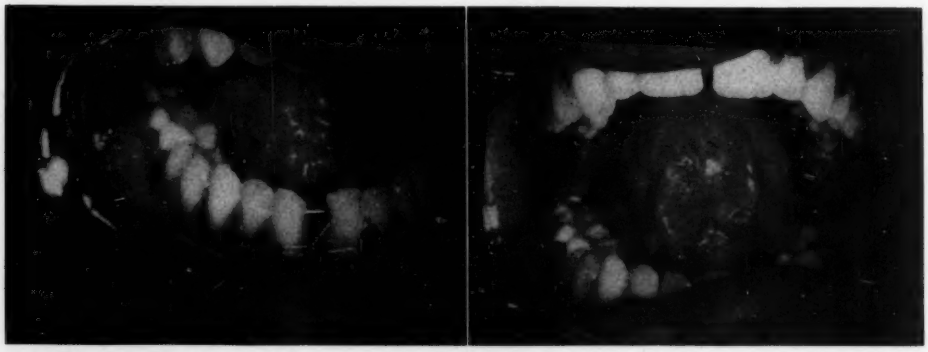

Fig. 3—Left: Intraoral view showing remaining ankyloglossia. Right: Postoperative view of tongue release, taken Feb. 26, 1960

The patient was followed daily at the hospital postoperatively. He progressed well with a minimum of discomfort and was discharged from the hospital Nov. 7.

On Nov. 10 he was seen at our office for postoperative care. His progress at this time was very good and he was extremely elated over his ability to move his mandible as one complete unit.

The patient's postoperative course has been followed closely. On Dec. 28, further roentgenograms were taken of the operative site (Fig. 2). On Jan. 4, 1960 an intraoral view was taken (Fig. 3, left). On Jan. 12, the patient was premedicated with meperidine 75 mg. and scopolamine 1/130 grain, prior to the further surgical relief of the ankyloglossia under local anesthesia. A postoperative view taken Feb. 26 is shown in Figure 3, right. On April 5, additional postoperative roentgenograms were taken and good union was noted (Fig. 4). The alveolar bone probably will never be able to regenerate between the central incisors.

Fig. 4—View taken April 5 which reveals bony union with incomplete regeneration of alveolar bone

RESULT—This young man has progressed very well. He now has a complete bony union at the site of the cleft and his ankyloglossia has been eliminated. His speech has improved tremendously and he now has good functional occlusion.—*2806 West Avenue.*

■ Hypertension

Effective treatment of hypertensive emergencies requires an agent which will reduce the blood pressure quickly and effectively. It is fortunate that a choice of drugs is available at this time. However, the potency of many of these agents is such that an intimate knowledge of pharmacodynamics of them is necessary if they are to be employed with maximum efficiency and safety. The very potency of many of these agents makes them dangerous if improperly employed. Marked elevation in blood pressure itself, even though due to many different causes, may become a direct threat to the patient's life if not brought under immediate control. This is so even though the elevated blood pressure may be only a part of the clinical syndrome. Under these circumstances control of the blood pressure can become the primary therapeutic problem and, in fact, can become a life saving procedure. *J. H. Moyer and E. W. Dennis, Treatment of Hypertension, Southern Medical Journal, June 1956.*

■ Do They Understand You? By Wesley Wiksell. 200 pages with illustrations. Index. $4.95. New York, Macmillan Co., 1960.

Although the author makes the point that most of his material is directed toward the employer-employee relationship, we, as dentists, have undoubtedly asked ourselves, "Do our patients understand us?" When we discuss treatment plans, do they understand us? When we discuss fees, do they understand? And when we answer their questions do they understand?

Mr. Wiksell refers to a definition by Webster of the word "communication" which says it is "the interchange of thoughts or opinions." Since it has been well established that "patient education" is one of the most important tasks we dentists have, it would seem prudent for us to take every means of improving our communications systems.

This book, written by a professor of speech at Louisiana State University, is primarily concerned with technics of face-to-face communication. Even though it is not aimed primarily at doctor-patient relationships, the suggested technics are basic and can be adapted to virtually any vis-a-vis relationship.

A subtitle calls the book a *Guide to Effective Communication*. Mr. Wiksell believes that sounds, gestures, posture, silence and facial expressions convey our feelings. The dentist, who is constantly attempting to communicate—and who more than not has difficulty in so doing—would do well to read this book.

The author has prepared an easily read, understandable text complemented by numerous illustrations. The publishers have seen to it that make-up, typography and binding are all in good taste.—*Theodore C. Levitas.*

■ Dental Auxiliary Personnel. The American Academy of Dental Practice Administration. 157 pages. Index. $3.85. St. Louis, C. V. Mosby Company, 1959.

A dearth of literature relating to the need to recruit, educate and obtain formally-trained dental assistants for the practicing dentist is immeasurably offset by the publication of *Dental Auxiliary Personnel* by the American Academy of Dental Practice Administration. The officers of the academy and particularly, Robert K. Stinaff, who served as editor of this reference book, are to be commended by the profession for making a valuable contribution to dental literature and stressing the importance of auxiliary personnel in the modern dental practice.

Dental Auxiliary Personnel contains the proceedings of a two-day workshop conducted by the academy January 30-31, 1958. That the workshop mechanism is an effective problem-solving device for the dental profession has been proved many times over in a retrospective glance at the many successful workshop conferences sponsored by councils of the American Dental Association. Similarly, these conference proceedings add further insights and useful information regarding problems of immediate interest and concern to the average practitioner seeking ways to improve and augment the dental care he can render to the public.

Editor Stinaff wisely has arranged the material from the conference into four major sections, each representing a workshop study unit. Each major section contains resource papers, discussion outlines, important questions and answers considered by the study group, and a roster of participants.

In addition to the practical purposes served by the printing of *Dental Auxiliary Personnel,* many dentists and dental assistants will be especially interested in the papers presented in the book's epilogue which relate conference objectives to long range needs of the profession.

The papers by Mr. Reginald H. Sullens, "A Projection of Dental Assistants' Education," and Walter J. Pelton, "Dentists and Dental Assistants in the Future," are particularly timely reading in view of the profession's present decision to conduct a major study to review and revaluate the functions of all dental auxiliary personnel. These two papers and the book in its entirety are of increased significance, too, in view of current drafts prepared by the A.D.A. Council on Dental Education of requirements for a national certifying board for dental assistants and standards for educational programs for this important auxiliary group.—*Ben F. Miller, III.*

■ ALLOPLASTISCHE IMPLANTATE IN DER ZAHNERSATZKUNDE (ARTIFICIAL IMPLANTS IN PROSTHETIC DENTISTRY). By Rolf Schwindling. 140 pages with 77 illustrations. Index. DM. 16. München, Carl Hanser, 1960.

In his introduction, the author presents not only a complete history of implants in prosthodontics but also an evaluation of the different methods of using them, and attempts to do so, comparing them with his own experiences. The major part of the book treats of his experiences of the past five years with patients treated at the University of Heidelberg.

He describes in detail the two-stage subperiosteal method of implanting the artificial nonmovable abutment, a metallic lattice work, within eight hours, which avoids the necessity of a second operation. In the author's opinion all other methods are failures sooner or later. His experiences are limited to the lower jaw. Chromium-cobalt-molybdenum alloy (Vitallium) is the metal of choice. Much depends on proper indication and exact surgical and technical procedures.

A large part of the book is devoted to clinical experimental observations as well as to roentgenographic and histopathological studies furnishing useful knowledge about the reaction of the tissue under the stress of usage. Using the facilities of a complete histological laboratory at his disposal, the author found in his tests no signs of tissue degeneration or irritation. Roentgenograms showed no bone changes in the region of the implants.

In the last chapter the author discusses the possible danger of osteomyelitis or any carcinogenic factors. No pathologic cell growth could be found in his culture tests. None of the artificial abutments had to be removed within the four years of observation. It would be worth while to learn how the same patients have fared in another five years.

The book is well written and the material logically arranged. The paper is good, the illustrations are exquisite and the index excellent. It is highly recommended for the general practitioner to keep himself informed, as well as for the specialist to be encouraged to strive for more improvements in the potentials of implants in prosthetic dentistry.—*Werner Bleifuss.*

■ HEALTH INSURANCE. By O. D. Dickerson. 500 pages. Index. $6. Homewood, Ill., Richard A. Irwin, Inc., 1959.

This book contains 19 chapters and six appendixes presenting an excellent and complete review of the entire field of health insurance. Although it is directed particularly to those engaged in the insurance industry, it is presented in such sequence and language as to make it interesting reading for the average layman. It provides answers to many questions which insurance policy holders often have asked.

Twenty pages are devoted to "Social Insurance," presented in a manner that enlightens the reader on such topics as O.A.S.D.I. (Social Security), which is of current interest to a great number of Americans. Other chapters in this part of the book answer questions pertaining to differences between commercial policies, guaranteed renewable, industrial and group policies.

A good résumé is given on the operations of health insurers, involving underwriting, rate making, reserves, claims, distribution and the background of state regulation.

The book is recommended reading.—*Edward H. Lindberg.*

■ THE NATIONAL FORMULARY — ELEVENTH EDITION. Committee on National Formulary, American Pharmaceutical Association. 560 pages. Index. $9. Washington, D. C., American Pharmaceutical Association, 1960.

The National Formulary contains official specifications for drugs used in medicine and dentistry, and descriptions of the reagents and methods employed to determine whether listed drugs meet the specifications. It is completely revised every five years, and interim supplements are sent free of charge to purchasers of the *Formulary*.

From the dental point of view, the eleventh edition is remarkable in that it contains descriptions of many local anesthetics and two vasoconstrictors, all useful in dentistry, for which official standards have not hitherto existed.

The book is much thinner than the tenth edition, but the page size is the same. This decrease in over-all size (and weight) has been achieved by the use of thinner paper and a new two-column format. Actually the eleventh edition lists 43 more drugs than the tenth, and the descriptive content has not been curtailed. The net result is a more convenient book to use.—*Donald A. Wallace.*

■ BACTERIOLOGY FOR STUDENTS OF DENTAL SURGERY. By R. B. Lucas, M.D., and Ivor R. H. Kramer, M.D.S. Second edition. 288 pages with 58 illustrations. Index. $6. Boston, Little, Brown and Company, 1959.

This British book, containing 27 chapters, is simply written, easy to read and clearly explains those portions of bacteriology which are covered. Unfortunately, however, there are a number of items which are either not discussed or inadequately discussed, making the book incomplete as a teaching textbook in this country. Its use as a means of review is restricted by the same complaint.

The standard topics in bacteriology, such as the morphology of organisms, bacteriological methods, the relation of bacteria to disease, infection, sterilization, chemotherapy, discussions of bacteria, fungi, protozoa, viruses and bacteriophage and the bacteriology of dental caries and periodontal disease, are as adequately covered as could be done in a book of this size. Two other items are included, the biology of bacteria and immunity. The first of these is incomplete as it lacks any material on bacterial metabolism and the second is incomplete in the discussion of the mechanism of natural immunity.—*T. L. Grisamore.*

■ CINEFLUOROGRAPHY—PROCEEDINGS OF THE FIRST ANNUAL SYMPOSIUM ON CINEFLUOROGRAPHY, UNIVERSITY OF ROCHESTER SCHOOL OF MEDICINE AND DENTISTRY. Edited by George H. S. Ramsey and others. 266 pages. Index. Springfield, Ill., Charles C Thomas, 1960.

It is rather unusual to find five authors chiefly responsible for a publication, and 18 others who have made contributions to the same text, as we find in this publication.

The title of the text, *Cinefluorography*, is not common in the dental literature at the present time, and a question naturally presents itself—will it be in the near future?

Cinefluorography means a roentgenographic picture which records the natural movements of the object of which a roentgenogram is being made. Normal movement, such as during digestion, is observed plainly. Much is found in the daily press and lay magazines about surgery of the heart, and we are told that cinefluorography is used in such instances to great advantage for the surgeon as well as the patient.

It is too daring a statement to make, at this time, that cinefluorography will never be of value in the field of dentistry; the future holds many great advances in medicine and

surgery, and no doubt some reflections of these advances will be in fields now considered as belonging to dentistry.

One of the real problems which presents itself to the dental practitioner as well as the specialist is a patient's complaint which apparently involves the temporomandibular joint. Cinefluorography may, and possibly can, shed additional light on this perplexing region, enabling the dentist to cope more successfully with these disturbances.—*Lee Roy Main.*

■ Radiation Protection and Dentistry. By A. H. Wuehrmann. 238 pages and illustrations. St. Louis, C. V. Mosby Co., 1960.

Roentgen ray is one form of ionizing radiation. Ionizing radiation is capable of causing harmful changes in living human tissue ranging from localized skin damage to gene mutations.

Gene mutation, which results from all forms of ionizing radiation as well as from heat and certain chemicals, may result in the production of defective offspring as well as in a gradual decline of the species. Even though dental diagnostic roentgenography contributes only a small part of the total radiation received by an individual, it is essential that every dentist understand clearly the potential hazards of this valuable diagnostic tool.

The general public has been bombarded with generalities and half-truths regarding the hazards of ionizing radiation by the press and other mass communication media. Ignorance by the public and dentists has led to either fear or blind complacency regarding the use of roentgen-ray radiation.

Dr. Wuehrmann has presented clearly and precisely the dangers of ionizing radiation and what the dentist must do to protect his patient, his ancillary personnel and himself. No attempt is made to either minimize or exaggerate the potential dangers of the use of ionizing radiation. The emphasis in this book is on the truth about the use of roentgenograms in dentistry and the responsibility of each dentist to understand and wisely utilize roentgenography in the diagnosis of dental disorders.

The book is extremely well organized and written. The style makes the material easily understandable to anyone with a dental background. In addition to the text and excellent drawings and photographs, there is a glossary of roentgenologic terms and a bibliography and survey of the pertinent literature.

This book was written for general practitioners of dentistry. It will probably be the most important book for dentists published in this decade.

I urge every dentist who uses a dental x-ray machine to read *Radiation Protection and Dentistry.*—*William F. Via, Jr.*

■ Accepted Dental Remedies. Twenty-sixth edition. Council on Dental Therapeutics. Chicago, American Dental Association, 1961.

The latest edition of *Accepted Dental Remedies,* an annual publication of the American Dental Association's Council on Dental Therapeutics, stresses forcefully the drugs used currently in medical practice. Special emphasis is given to the taking of an adequate medical history as a method of preventing complications during treatment.

Included is information concerning drugs of proved worth in dentistry as well as recently introduced drugs which have an uncertain status at this printing. Drugs once useful but now considered obsolete are covered as well. Accepted dosage forms are given only for preparations of recognized value.

The chapter covering treatment of patients receiving medical care is timely and serves as an excellent reference.

Descriptions of action of the drugs, uses, indications and contraindications, are concise and to the point. The accepted dosage forms at the end of each chapter list drugs by generic and brand names and include the manufacturer. Adequate references to the literature accompany the different sections of the book.

This small but informative volume provides a quick and ready pharmacological reference to the busy practitioner and is given an unqualified recommendation.—*David L. Ford.*

■ Irradiation of Hemangiopericytoma of Stout. Milton Friedman and John W. Egan. Radiology. 74:721 May 1960.

The role of irradiation in the management of connective tissue sarcoma is not well defined because the resistance to irradiation of most sarcomas has discouraged its use as aggressive therapy. Some of these tumors, however, are moderately radiosensitive and irradiation should play an important role in their treatment. Five cases are reported.

The treatment of hemangiopericytoma of Stout is complicated by the diversified clinical picture.The fact is that it can arise in many parts of the body including bone as well as connective tissues, and it is frequently impossible to differentiate histologically between benign and malignant forms. Surgical excision is the treatment of choice. Irradiation is frequently indicated, however, because of inoperability or incomplete excision to avoid amputation and for palliation in advanced stages of the disease.—*Irwin A. Small.*

■ Micrognathia in the Newborn: Pierre Robin Syndrome. R. M. Rankow and F. Minervini. Plast. & Reconstr. Surg. 25:606 June 1960.

Newborn infants may be affected by micrognathia, glossoptosis and respiratory distress. This syndrome is frequently associated with a cleft palate and bears the name Pierre Robin.

In 1946 Beverly Douglas published his first paper on the treatment of this syndrome by means of a surgical fusion of the tongue to the lower lip. This method has proved entirely satisfactory in the experience of many other clinics.

At the Columbia Presbyterian Medical Center, during the past seven years, five instances of micrognathia with Pierre Robin syndrome were treated in the Beverly Douglas manner. Tracheotomy, resorted to in one patient, proved a life-saving procedure. It is not recommended more frequently because of the prolonged hospitalization it entails. Milder and atypical forms of this syndrome are occasionally encountered. Careful positioning at feeding time and a conservative approach may prove adequate. Signs of respiratory obstruction and severe feeding difficulties are indications for prompt surgical intervention. Each of the five instances is discussed in detail.—*Myron Kaufman.*

■ The Effect of Snuff and Tobacco on the Production of Oral Carcinoma. E. E. Peacock, Jr., B. G. Greenberg and B. W. Brawley. Ann. Surg. 151:542 April 1960.

A significant relationship between the development of oral carcinoma and the chronic use of snuff and tobacco has been implied often but never has been proved by laboratory tests or statistical analysis.

Of patients treated for oral cancer at the North Carolina Memorial Hospital, 55.6 per cent gave a history of having used snuff and tobacco for over 20 years. Comparison of these patients with a series of patients who also had used snuff and tobacco for over 20 years and did not develop oral cancer, showed a significant relationship between carcinoma and the chronic use of snuff and tobacco only in individuals from a low economic status who were over 60 years of age.

A highly significant relation between the chronic use of snuff and tobacco in the develop-

ment of oral leukoplakia was discovered in a survey of textile mill workers. The relationship became more significant with advancing age.

Analysis of the data obtained from laboratory experiments and analytical survey strongly suggests that snuff and tobacco are promoting influences but not specifically initiating factors in the development of oral carcinoma.—*Myron Kaufman.*

■ Clinical Evaluation of Cleft Palate Patients and Their Speech. Alan R. Vini Coff. Plast. & Reconstr. Surg. 25:496 May 1960.

The desired goal in the treatment of patients with repaired cleft palate is normal speech and if this result is not achieved after surgical repair, the therapy is incomplete. Most of the terms used to describe cleft palate speech are subjective and imply abnormality. It is difficult to determine what is normal speech and how it should be recognized. A knowledge of normal speech mechanisms provides a foundation for a better understanding of abnormal speech. This, in turn, can eliminate much of the guess work and supposition encountered in cleft palate therapy. A brief description of the factors involved in normal speech production is given. Some generalizations are made regarding the relation of speech to cleft palate therapy. Evaluation of the condition of a hypothetical patient with a cleft palate speech disability is demonstrated with suggested courses of action.—*Myron Kaufman.*

■ Elective Neck Dissection for Intraoral Cancer. H. W. Southwick, D. P. Slaughter and E. T. Trevino. A.M.A. Arch. Surg. 80:905 June 1960.

This study is a review of the information obtained from 192 operations for intraoral cancer. The surgery in each instance included the removal of the primary tumor accompanied by a unilateral or bilateral neck dissection. Although all forms of intraoral cancer are included, squamous cell carcinoma primary in the tongue and lower floor of the mouth accounted for 52 per cent of the cases. The correlation between clinical and microscopic regional node metastasis is of considerable interest. Microscopic evidence of metastatic disease was present in 50 per cent of the cases. Clinically, negative nodes were microscopically positive in 39.9 per cent. There were no instances of primary contralateral metastasis.

With this information as a background, it seems illogical to accept the principle of en bloc dissection for malignant epithelial tumors elsewhere and to ignore it in the treatment of carcinoma of the tongue and floor of the mouth. When the patient's general state of health does not contraindicate such an operation, a regional node dissection should accompany the primary treatment of such lesions, whether or not the nodes are clinically involved with tumor. The neck dissection should be performed in continuity unless it is technically unreasonable to do so.—*Myron Kaufman.*

■ The Treatment of Osteoradionecrosis of the Mandible. S. W. Masters, M.D.; R. L. Klaus, M.D., and D. W. Robinson, M.D. Am. J. Surg. 98:887 Dec. 1959.

Osteoradionecrosis of the mandible is a common complication of radiation therapy for intraoral malignancy and results from a combination of radiation, infection and trauma. Radiation injury presents a clinical picture of pain, trismus, ulceration and fetor which is amenable to specific surgical therapy. Treatment depends on pathologic conditions present. If malignancy exists, therapy is directed toward the ablation of carcinoma, although surgical excision of painful radiation necrosis may be a valuable palliative weapon. Surgery should not be deferred once symptoms of radionecrosis have appeared. The inexorable nature of the disease militates against temporization and, perhaps, if resection to bleeding bone is performed early, partially damaged bone which is not subjected to low-grade chronic infection over a long period of time may survive, as its nutrition may be provided by surrounding soft tissue, free

of infection and foreign body reaction. Primary osteonecrosis not associated with malignancy, if each case is given carefully individualized attention, can be treated so as to produce traumatic relief of symptoms with a low mortality rate.—*Myron Kaufman.*

■ NEUROFIBROMATOSIS (VON RECKLINGHAUSEN'S DISEASE) OF THE HEAD AND NECK: COSMETIC AND RECONSTRUCTIVE ASPECTS. L. V. Kragh, E. H. Soule and J. K. Masson. Plast. & Reconstr. Surg. 25:565 June 1960.

Since its first clinical description 100 years ago, neurofibromatosis has been found to have many and varied manifestations. Though a vast literature has accumulated on the clinical manifestations of this disease, little has been written on the cosmetic and reconstructive aspects. The authors reviewed the cases of neurofibromatosis involving the head and neck encountered at the Mayo Clinic from 1945 to 1957, inclusive, and studied the clinical and pathologic features, and the cosmetic rehabilitation of the patients. During this period 328 patients were diagnosed as having neurofibromatosis. Of this total, 47 patients underwent surgical removal of the lesion. Sarcomas developed in 3 of the 47 patients. This study suggests that these patients can be operated on to attempt cosmetic improvement of their defects without undue risks of sarcomatous degeneration.—*Myron Kaufman.*

■ FATAL GRANULOMATOSIS OF THE RESPIRATORY TRACT. Irving Blatt, M.D.; Holbrook E. Seltzer, M.D.; Philip Rubin, M.D.; A. C. Furstenberg, M.D.; James Maxwell, M.D., and William Schull, Ph.D. A.M.A. Arch. Otolaryng. 70:707 Dec. 1959.

The rhinopharyngologic-midfacial disease described by Stewart and the rhinologic-systemic syndrome described by Wegner are one and the same disease process—a granulomatosis necrotizing angiitis, primary in the respiratory tract with systemic involvement and invariably fatal. A review of 112 cases from the medical literature and 12 from the University of Michigan makes it possible to formulate the clinical manifestations of the period of active disease and to observe the effects of various methods of treatments.

Surgical intervention increased the morbidity and intensity of the ulceronecrotic destructive process in the midfacial and other regions of the body thereby creating deformities shocking to behold. When adrenal steroid therapy is used, patients apparently are spared the frightful destruction of the bone and soft tissue, particularly in the facial region. The over-all therapeutic response is usually good and it is possible to extend the lives of these doomed people by months or even years. The antibacterial activity of the antibiotic drugs has been invaluable in eliminating secondary invaders. Ionizing irradiation may find its effectiveness in treatment of this inflammatory lesion.

The lethal midline granuloma, Wegner's granulomatosis, is a hypersensitivity reaction invoked by an autoantigen-antibody mechanism. —*Irwin A. Small.*

■ NEW ONLAY-INLAY METAL SPLINT FOR THE IMMOBILIZATION OF MANDIBULAR FRACTURES. Marsh Robinson, M.D. Plast. & Reconstr. Surg. 25:77 Jan. 1960.

Immobilization of the fractured mandible after open reduction is often difficult because of the displacing muscle forces in unfavorable cases.

With a no. 701 Fisher bur, a groove is made just through the cortical plate perpendicular to the fracture and long enough to accommodate the plate. The old plate is approximately 1.5 mm. on the short side to go into the groove and made in various lengths from 12 to 24 mm. The onlaid portion is perforated with from 4 to 8 holes so that alternate holes can be used for screws. The inlaid portion resists the muscle poles and immobilizes the fracture. The onlay portion of the splint is merely to keep the inlay portion in position.

These plates can be placed without elevating the periosteum from the lingual surface, thereby preserving the blood supply. They re-

quire only two small screws, thus reducing the amount of metal implanted in the number of holes drilled.—*Donald B. Rae.*

■ THE DIAGNOSTIC AND PROGNOSTIC VALUE OF ORAL SMEARS IN THE RADIO THERAPY OF CARCINOMA OF THE ORAL CAVITY AND OROPHARYNX. William Umiker, M.D.; Isadore Lampe, M.D., and Robert Rapp, M.D. Am. J. Roentg. 85:69 Jan. 1961.

There has been a paucity of reports concerning radiosensitivity of benign and malignant cells in carcinomas of the oral cavity. The cytologic effects of radiation on benign and malignant cells in oral smears have been described, and preliminary prognostic implications postulated on the basis of observations on a small series of patients. This report concerns evaluation of the diagnostic and prognostic significance of oral smears in a larger series of patients who received external irradiation for carcinomas of the oral cavity or oropharynx.

Direct smears were obtained from the surfaces of 55 oral carcinomas (tongue, gingiva, floor of the mouth, anterior tonsillar pillar, retromolar region, and hard palate) prior to, during, and after irradiation. Companion smears were taken from the adjacent uninvolved mucosa within the field of irradiation. The following studies have been made: (1) radiation changes in benign squamous cells; (2) radiation changes in malignant cells; (3) exfoliation of malignant cells; (4) conversion of positive to negative smears; (5) detection of recurrent neoplasm. No constant variation could be demonstrated between the radiation changes and benign cells in the exfoliation or rate of disappearance of the malignant cells, the maturation of nuclear protein patterns of the malignant cells or the development of radionecrosis.

The radiation changes of the type described in benign cells were also demonstrated in malignant cells but were more difficult to assess quantitatively. Therefore, effort was directed instead to measuring the effects on maturation and differentiation of the tumors, and on Caspersson's criteria of variability. The findings of the current studies support the initial observations; namely, that the conversion from type A to type B cells is a good prognostic sign. The median percentage of type A cells decreased only slightly in 14 patients who had residual carcinoma, whereas there was a pronounced decrease of type A cells and a proportionate increase in type B cells in the 18 patients. There was no clinical evidence of residual neoplasm. There were considerable differences in the exfoliation of malignant cells from neoplasms which are otherwise similar in location, size, close characteristics, and histologic differentiation.

The presence of malignant cells in oral smears taken at the end of treatment does not preclude irradiation arrest, and many patients showed conversion of positive to negative smears after completion of treatment.

Oral smears taken during the first three months after treatment are of practical prognostic value. Every patient whose smears were positive during that period was ultimately proved to have residual recurrent neoplasm, but only 11 per cent of patients with negative smears at that time had residual neoplasm.—*Donald B. Rae.*

■ EXPERIENCES WITH THE PHARYNGEAL FLAP IN CLEFT PALATE SURGERY. Herbert Conway, M.D., and Dicran Goulian, Jr., M.D., D.D.S. Plast. & Reconstr. Surg. 26:590 Dec. 1960.

After successful closure of congenital clefts of the palate, a certain percentage of patients, principally that group in which the primary defect was an incomplete cleft of the palate, will continue to exhibit unacceptable speech. There are two basic problems. An excessive velopharyngeal space will prevent the patient from closing off the nasal from the oropharynx in the process of forming the glottic stops necessary to produce the sounds of consonants; and the absence of adequate soft palate musculature to effect such closure. These problems have been handled with the aid of a pharyngeal flap, used either with or without a palatal push-back. The procedure deemed most effective is the single stage palatal push-back, in combination with an inferiorly based pharyngeal flap. After

rehabilitation with the pharyngeal flap procedure, 142 of the 162 patients had acceptable speech; that is, 87.7 per cent. Of this group, 50 per cent required postoperative speech therapy to achieve maximal results. There were eight complications in the entire group—an incidence of 4.9 per cent. This procedure is looked upon as a technic for reclamation in instances in which primary suture has failed.—*Donald B. Rae.*

■ Osteogenic Sarcoma of the Mandible. A. C. Gomez, R. D. Youmans and R. G. Chambers. Am. J. Surg. 100:613 Oct. 1960.

Osteogenic sarcoma of the mandible is rare. Early diagnosis is possible because of its accessible anatomic position, provided various specialists recognize that osteogenic sarcoma is not hopeless if an aggressive approach is employed, both in suspecting its presence and treating it with a suggested combined form of therapy. Morbidity is minimal. The authors have combined both radiation and surgery as the best form of treatment and the best approach to this problem in the mandible. From the various methods of radiation available, intratumoral therapy would seem to be the best for this anatomic site. It is believed that by necessity the radiation must be given as a necrotizing dose in the shortest time interval practicable. Since immediate extirpation of the tumor is necessary after radiation, any form of external treatment is contraindicated. The radium needles placed in and about the mandibular tumor best fulfill the afore-mentioned criteria. Objections may be raised to the traumatic placement of radium needles through the tumor. However, the dissemination of tumor cells with this interstitial radiation, both intratumoral and intraosseous, should not spread tumor any more than a simple biopsy. Furthermore, the necrotizing effects of the radium should begin promptly. The variability of the factors promoting tumor dissemination should be offset by the expected effectiveness of this method.

Mandibular osteogenic sarcomas, by virtue of their anatomic position, should be studied separately so the effectiveness of similar forms of treatment can be better evaluated. Two cases are presented and these as well as any subsequent patients will be periodically reviewed and reported by the authors.—*Myron Kaufman.*

■ Odontogenic Tumors, Classification, Histopathology, and Clinical Behavior in Man and Domesticated Animals. Robert J. Gorlin, D.D.S., Amand P. Chaudhry, D.C.S., Ph.D., and Jens J. Pindborg, D.D.S., D. Odont. Cancer 14:73 Jan.-Feb. 1961.

The subject of odontogenic tumors in man and domesticated animals is beginning to take form. With minor modification, the Pindborg and Clausen classification has been adopted as the basis for discussion of odontogenic tumors in this study. Each tumor has been described in detail, and its pathogenesis discussed in relation to its place in the new classification. The classification of odontogenic tumors presented in this paper uses an orderly and logical approach. The breakdown of tumors manifesting induction of connective tissues is perhaps too well defined, for intermediate types are not rare. The possible maturation of one type into another is in need of investigation. As a general rule, however, epithelial odontogenic tumors resulting from inductive influence on connective tissue behave entirely like benign tumors, seldom recur, and are self-limiting. Their behavior is more consistent with that of hamartoma rather than neoplasm.

Most odontogenic tumors arise and are clinically manifested between birth and 21 years of age. However, the ameloblastoma and the calcifying epithelial odontogenic tumor are rarely seen in individuals less than 21 years of age. These too should be treated by more than simple curettage. The myxoma is an infiltrating neoplasm that may recur and cause considerable local destruction.

The field of animal oral pathology has been largely unexplored. Reports of odontogenic tumor in animals have been sporadic, and there has been no previous attempt to classify them or to correlate them with their human counterparts. Studies in animals now

underway on these lesions arising from the tooth germ may shed considerable light on the influence of one tissue upon another and yield answers to the many questions we face daily in the field of human odontogenic pathology.—*Donald B. Rae.*

■ Lymphangioma of the Tongue. H. Mason Morfit, M.D. Arch. Surg. 81:761 Nov. 1960.

When a lymphangioma involves the tongue, a condition frequently referred to as macroglossia occurs and brings with it a set of problems unique to this anatomic location and produces a degree of involvement frequently defying complete extirpation.

This paper reports the efforts to treat eight patients with this lesion, three of whom have now been followed 10 to 13 years. In all eight patients, the growths in the tongue were noted at, or shortly after, birth. The special problems created by this lesion stem primarily from the increase in bulk of the tongue and its subsequent effect on the adjacent teeth and mandible. As the tongue increases in size, it can no longer be housed within the oral cavity and protrudes from the mouth. This results in the teeth being forced outward so that occlusion is no longer possible. Outward bowing of the mandible appears for the same reason and usually involves the horizontal ramus subjected to the greatest pressure.

Effective treatment should be based on the now fairly certain knowledge that this lesion is not a potential killer, that it produces difficulty primarily because of its size, and that complete extirpation is not necessary for favorable results. Extremely radical operations aimed at total excision, therefore, are to be condemned. The simple objective of surgery is to remove enough of the tongue so that the organ will fit comfortably within the confines of the oral cavity, not impinge on the occlusal line of the teeth, and not press on the malleable mandibular arch. The technic for multiple stage excision is outlined.

After the patient attains his full bodily growth, and usually by the completion of adolescence, the author's experience indicates that the lymphangioma also stabilizes and does not increase in size.

A few words are stated about the use of roentgenotherapy in treating these tumors. The lesion does not possess any extraordinary sensitivity to roentgen rays despite the fact that the spaces are lined with single-layer endothelial cells. Although reduction in growth can be achieved, to do this the dose must be carried to a level where it would have a sclerosing effect. If this is done, the side effects of arrested development in the mandible and irreparable damage to dental structures, plus the fact that the tumor persists after treatment, negate the use of roentgen rays regardless of its method of administration or the skill of the radiotherapist. —*Myron Kaufman.*

■ The Value of Oxygenation Prior to Induced Apnea. Mitsugu Fujimori and Robert Virtue. Anesthesiology 21:46. Jan.-Feb. 1960.

The common use of apneic technics during the induction of anesthesia may expose the patient to hypoxia. It is desirable to adopt a procedure which will protect the patient against prolonged hypoxia. Experiments were undertaken to compare the productive effects of ventilation with air and with 100 per cent oxygen before apnea.

Nineteen dogs were sedated with pentobarbital sodium and made apneic with succinylcholine chloride. Their lungs were artificially ventilated with air for 20 minutes. Ventilation was then suddenly stopped. An average period of 4.45 minutes elapsed before the electroencephalogram tracing became isoelectric. The experiment was repeated with 100 per cent oxygen for 30 seconds before the respirator was stopped. The average time before the flat tracing appeared was 12.39 minutes. In the third experiment, artificial respiration was carried on for 30 minutes with 100 per cent oxygen. The EEG tracing became isoelectric in 16.51 minutes. Cardiac arrhythmias and aberrations of the EEG occurred regularly before these apneic periods had elapsed.

Using the flat EEG tracing as a criterion

for the occurrence of dangerous hypoxia, it appears that pulmonary ventilation with oxygen rather than air before production of apnea affords significantly greater safety for the subject. Increasing the period of oxygenation from 30 seconds to 30 minutes did not significantly alter results.—*Irwin A. Small.*

■ THE ADDITION OF A PHARYNGEAL FLAP TO PRIMARY PALATOPLASTY. R. B. Stark, M.D., and C. R. DeHaan, M.D. Plast. & Reconstr. Surg. 26:378 Oct. 1960.

A brief history is presented of the various approaches to palatoplasty beginning with the latter part of the eighteenth century and extending to the present time. Beginning in 1955, a pharyngeal flap based inferiorly or superiorly was elevated and used to close the pharyngeal donor defect, and to suture the flap to the palate which was repaired at the same time in the manner of von Langenbeck. This was done in one-year-old infants before the onset of speech.

The use of a pedicle flap of mucosa, submucosa, and superior constrictor muscle from the posterior pharynx in the primary repair of a cleft of the palate is based on three premises: (1) clefts of the palate, especially those of the soft palate alone, have a paucity of mesoderm as the basis of their pathogenesis, and such a muscular deficiency logically requires the addition of dynamic tissue in the region of the soft palate; (2) by closing the donor defect occasioned by elevation of the pharyngeal flap as well as by partially occluding the pharynx by the flap, one is performing a pharyngoplasty that narrows the pharyngoaperture, which, in turn, reduces the nasal escape of the air; (3) the open cleft of the palate provides the plastic surgeon with the best opportunity to develop and elevate the pharyngeal flap so that it will base most advantageously for attachment to the soft palate. In addition, closure of the defect is facilitated greatly by such unimpeded surgical exposure, obtained without retraction.

Because the flap-velum anastomosis is more difficult to achieve technically when the superior base has been used, and because it is more difficult during the early part of the follow-up period to ascertain whether the flap has remained attached, the inferiorly based flap is preferred except in the presence of hypertrophied adenoid tissue.

Since 1955, the authors have performed 22 pharyngeal flaps at the time of primary surgery on the palate and 16 secondary flaps. Not one patient who had such a procedure accomplished before the onset of speech, at the age of one year, required speech therapy subsequent to the onset of speech. Such a primary procedure performed after the onset of speech, however, usually requires prolonged speech therapy to obtain speech reversal with socially acceptable speech. This is true also of patients in whom the pharyngeal flap is used as a secondary palatoplasty. The authors' investigations have also indicated that hearing has been preserved best by early closure of the cleft, especially when the palatoplasty has been combined with a pharyngeal flap. It has not been found necessary or even desirable in the infant to combine palatal repair of the push-back type with a primary pharyngeal flap. These data, small as they are and as yet incompletely controlled, suggest a need for closure of the palate before the onset of speech to avoid the herculean problems of speech reversal. The Dott mouth-gag permits endotracheal anesthesia to be given, and, at the same time secures and depresses the tube between the blade and the tongue out of the surgical field.—*Myron Kaufman.*

Announcements

■ International Dental Group To Meet in Finland

The forty-ninth annual session of the Fédération Dentaire Internationale will be held in Helsinki, Finland, July 9-15. The Finnish organizing committee has prepared a detailed program including reports on anesthesia, the physiology and pathology of pain and progress of research.

In addition, an extensive and interesting social program has been prepared including sightseeing tours of Helsinki and Finland. Enrollment and hotel reservation forms may be obtained from G. H. Leatherman, general secretary, 35 Devonshire Place, London, W.1, England.

■ Oral Pathology Fellowship at University of Pennsylvania

Applications are being accepted for a Clinical Fellow in Oral Pathology supported by the American Cancer Society and tenable at the Department of Pathology, School of Dentistry, University of Pennsylvania. The fellowship, which is for a period of one year beginning July 1, 1961, is open to U.S. citizens who are graduates of a U.S. dental school. A stipend of $3,600, tax free, accompanies the fellowship.

The program is planned to suit the specific needs and interests of the Fellow. Each candidate should submit a curriculum vitae and letters of reference to: Dr. C. W. Wilde, Jr., Department of Pathology, School of Dentistry, University of Pennsylvania, 4001 Spruce St., Philadelphia 4.

■ Albert Einstein College Offers Postgraduate Courses

The Albert Einstein College of Medicine, Department of Dentistry, will sponsor postgraduate courses in anesthesiology, endodontia, oral pathology, oral surgery, periodontia and prosthetics during the spring of 1961. These courses are designed to be integrated into the general dental practice. Lecture sessions will be held at the Albert Einstein College of Medicine, and the clinical demonstrations at the Dental Clinic, Jacobi Hospital.

For further information and application, write to Director, Postgraduate Dental Division, Albert Einstein College of Medicine, Eastchester Rd. and Morris Park Ave., Bronx 61, N.Y.

■ Rotating Internship Available at Baltimore Hospital

The Children's Hospital of Baltimore is accepting applications for a full-time internship to begin July 1. The internship is of the rotating variety and will stress dentistry for the handicapped and the use of general anesthesia in complete dental service. The training will be given with the cooperation of the department of pediatrics of Johns Hopkins Hospital. Inquiries should be addressed to Mr. Christian M. Christiansen, administrator, 3825 Greenspring Ave., Baltimore 11.

■ Maxillofacial Prosthetics Academy Elects Officers

Benjamin M. Hoffman of Coral Gables, Calif., was elected president of the American Academy of Maxillofacial Prosthetics during the group's ninth annual meeting in Los Angeles. Other officers elected at the October meeting were: president-elect, Edward J. Frederickson, Spokane, Wash.; vice-president, I. Kenneth Adisman, New York; secretary, Joseph B. Drane, Houston, Texas; treasurer, James B. Scannell, Jamaica, Queens, N.Y.; executive secretary, Mervin C. Cleaver, Coytesville–Fort Lee, N.J.; and editor, Arthur H. Bulbulbian, Mayo Clinic, Rochester, Minn.

October 11-13, 1961, are the dates selected for the Academy's tenth annual meeting, which will be held at the Benjamin Franklin Hotel, Philadelphia. The general business meeting and the professional program will begin Thursday morning, the 12th. For further information write: Dr. Mervin C. Cleaver, executive secretary, 2330 Linwood Ave., Apt. 3H, Coytesville-Fort Lee, N.J.

■ Hospital Dental Service Institute Set For Boston

A Basic Institute on Hospital Dental Service will be held at the Somerset Hotel, Boston, May 15-18. The Institute, sponsored by the American Dental Association's Council on Hospital Dental Service and the American Hospital Association, will include a report by Mr. Howard I. Wells, Jr., executive secretary, Joint Council to Improve Health Care of the Aged. Mr. Wells will speak on "The Work of Dentists in the Joint Council to Improve Health Care of the Aged," during the afternoon session, May 16. Also scheduled for that afternoon are two reports on "Inservice Training for Staff Dentists" and "Dental Internships and Residencies."

The morning session, May 15, will feature a report by Mr. Paul J. Spencer, director, Faulkner Hospital, Boston, on "The Art of Delegation," and the afternoon session will include a talk on "Interprofessional Relations" by F. Lloyd Mussells, M.D., director, Peter Bent Brigham Hospital, Boston.

"How the Hospital Functions" will be discussed by Mr. Richard T. Viguers, director, New England Center Hospital, Boston, during the morning session, May 16. Also at that session, Philip D. Bonnet, M.D., administrator, Massachusetts Memorial Hospital, Boston, will speak on "Orienting Dentists to Hospital Procedures."

A feature of the May 17 morning session will be the report on "Dental Program for Handicapped Patients" by Burton R. Pollack, director, Dental Treatment Center, The Children's Hospital, Baltimore.

Further information may be obtained by writing to the Council on Hospital Dental Service, American Dental Association, 222 E. Superior St., Chicago 11.

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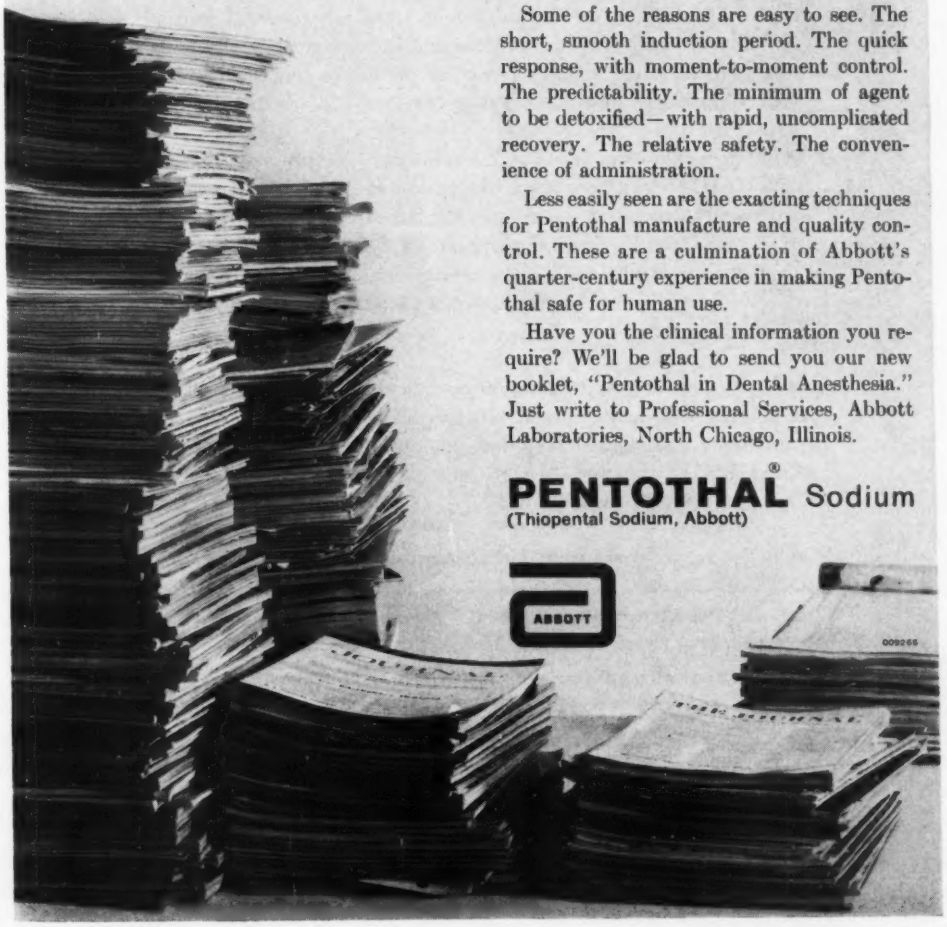

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—Webster's New International Dictionary, 2nd Edition

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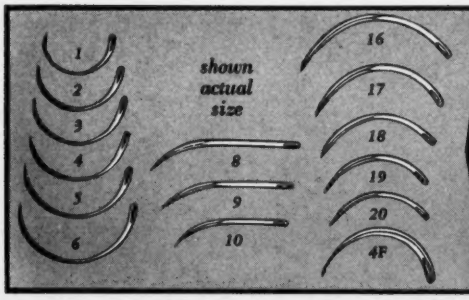

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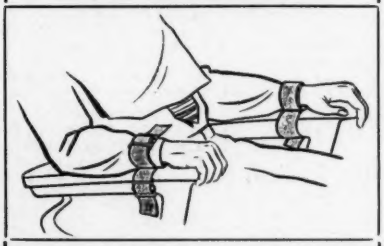

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